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Hon. J. P. B. CASGRAIN

The Problems of Transportation in Canada

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Quebec, 1909

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NOTE

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The numerous requests I have received for the following speeches and with which I have been unable to comply, as the first edition is now quite exhausted, have rendered the publication of a second edition necessary.

In the present edition, I have, for the sake of clearness, omitted all those repetitions which necessarily occur when replying to interruptions in the course of a debate, and these omissions have obviously necessitated some transpositions in the subject matter; but not a single statement or figure has been altered.

The questions discussed in the following pages, and of which I have made a professional study, are of such magnitude, dealing as they do with great national undertakings for the execution of which a vast expenditure will be necessary, that they are bound to exercise a powerful influence on the future of this young nation and even on the Empire. I need not therefore apologize for having treated them at such considerable length.

All nations which have become great have fully realised the vital importance of easy communications. The famous Roman roads, by means of which the decrees of the mighty Imperial Senate reached the uttermost parts of Asia and Europe, still bear witness to the greatness of the Roman Empire, and what Rome did 2000 years ago, England is at this very day doing in India, in Nigeria and in Uganda.

Let us imitate their example, even if it should entail some slight temporary sacrifice on our part, for we could not leave a nobler legacy to our children, nor render a greater service to our country, than by rendering more perfect our means of communication and thereby uniting more closely the various provinces of our great Dominion.

Montreal, August, 1909.

THE PROBLEMS OF TRANSPORTATION IN CANADA.

The National Transcontinental Railway

Speech delivered in the Senate on the 13th. October 1903

I humbly confess that I rise with considerable diffidence to reply to the arguments of the hon. leader of the Opposition. It will however be noticed, that he has left to be discussed by those who are to follow him a great number of the most weighty features of this very important measure.

I propose to deal, first, with the question of the bonding privilege; secondly, to say a few words on the strategical importance of the proposed railway; thirdly, to give the reasons, which necessitate the immediate construction of the Transcontinental; fourthly, to describe the route it follows and the country it traverses; and lastly to examine the conditions of our contact with the Grand Trunk Pacific Railway Company for the construction of the road.

Bonding privilige liable to abrogation.

And first as to the bonding privilege to which the hon. gentleman has alluded at such great length, I understand that other gentlemen on this side of the House hold different views to him on that question.

Let me draw the attention of the Senate to the fact, that when the hon. gentleman himself was in conference with the hon. J. D. Blaine, the latter told him that the United States government never thought of doing such a

thing as abrogating the bonding privilege; and that there was positively no necessity for building another Sault Ste. Marie Canal; nevertheless, the hon. gentleman placed no faith in such assurances and the government did build the canal.

Sir Wilfrid Laurier declares construction of Transcontinental imperative.

With regard to the speech of the Hon. Sir Wilfrid Laurier concerning the bonding privilege, to which allusion has been made, when Sir Wilfrid made that speech in the House of Commons, he gave the reasons why, if we wished to live in peace and harmony with our neighbours to the south, the wisest course to follow was to have as little as possible to do with them, and he quoted letters from Mr. Carnegie showing how and when this bonding privilege may be abrogated at any moment. He also quoted a message to the same effect from Mr. Cleveland. At every turn and corner in the policy advocated by

Canada, this threat was held, like the sword of Damocles, over the Canadian Parliament and people; and the House of Commons cheered him to the echo, when he announced that the intention of this measure was to build on Canadian territory, on British soil, one grand transcontinental line from Ocean to Ocean.

Original proposal for Canadian Pacific Railway.

It will be remembered that when the Canadian Pacific Railway was originally proposed, it was not intented to build it from Ocean to Ocean. It was to start from Ontario to establish communication with British Columbia as this was one of the conditions of the union of that Province with the Dominion.

There was no intention at the time of extending the Canadian Pacific Railway as far as the Atlantic Ocean. In fact, a point in Ontario was selected at some distance west of the city of Ottawa for its eastern terminus, and we all remember, especially does the hon. leader

of the Opposition know and remember, the tremendons pressure that was brought to bear on the government, of which he was a member, to force them to make Quebec the eastern Terminus of the Canadian Pacific Railway, and thus compel them to buy the North Shore Railway. This may be ancient history, but it bears on the point that this is the first instance in which the construction of a great transcontinental line, extending from Ocean to Ocean, is proposed in a single measure. When I say from Ocean to Ocean, we know how near Moncton, the Eastern terminus, is to the sea.

Strategical importance of Transcontinental.

I am surprised that the hon. gentleman has made light of the strategical importance of the Transcontinental. One need not be versed in military science to realize that in case of war this new route would be of immense value not only to Canada but to the Empire.

To this country, it will provide a practically invulnerable line of communication between the East and West, for the Transcontinental line will be built at such considerable distance from the frontier that it will be safe from attack, and everyone knows that nothing is more important in war than a secure line of communication.

I am aware that for a short distance the proposed line must unavoidably pass dangerously near the northern frontier of the state of Maine; but that need not cause any apprehension, at all events for many years, for the northern part of Maine is so densely wooded and so destitute of communication, that it would not be possible to carry on military operations there with a large body of men; and the railway therefore could only be cut by a "coup de main" and special precautions could be taken to protect it against a raid of that nature.

To the mother country, the Transcontinental will furnish an additional and more rapid

route to her great indian Dependency. Hence it is, the war office attached so much importance to the construction of the Trans-Canada Railway which would have followed the same route as the Transcontinental, for the military authorities in England were not slow to recognise the great strategical importance of this new route which my hon. friend has failed to appreciate.

I do not think it is necessary for me to say anything further to convince the House of the military advantages of this new route

Immediate construction of Transcontinental urgently necessary.

Now as to the expediency of undertaking this great enterprise at the present time, my hon. friend has not proved —to my satisfaction at any rate —that the construction of the Transcontinental is inopportune, premature and not necessary; and I believe that his views on that question, if such really be his views, are not those of the majority of

the representatives of the people in the other Chamber, nor of the majority of the members of this House.

I believe, on the contrary, that if there ever was a time, as the hon. Secretary of State has said, when such a road should be built, it is at this present moment, when settlers are coming into the country in such large numbers, that the expenditure which the government will be called upon to incur in the prosecution of this national undertaking will be easily met by the increased revenue, which the influx of settlers will produce.

Mr. Blair also thought there was no immediate necessity to proceed with the enterprise. But I am surprised that during the long protracted debate, which took place in the House of Commons, no one recalled an incident which is very well remembered in the city of Montreal, and which occurred at a great banquet tendered to Mr. Charles M. Hays on the occasion of his departure from the city of Montreal

to take the control of a large railway line in California.

The hon. gentleman from de Lorimier was asked to speak on behalf of the Senate at that banquet. But, at the last moment, he was unable to be present, and asked me to replace him.

The hon. Mr. Blair was there, representing the Government and also the House of Commons. On that occasion, it was my privilege to speak of the high esteem in which Mr. Hays is held, and I am glad to see that the leader of the Opposition has done the same thing this afternoon. The hon. gentleman said that Mr. Hays was one of the best railway men, probably second to none in Canada to day, and perhaps had few peers in the United States.

Mr. Blair, at that time, had had a little friction with the Canadian Pacific Railway. It was the first time he had an opportunity of speaking in the city of Montreal after this friction, and he thought he would give the Canadian Pacific Railway a piece of his mind.

Mr. Blair's opinion. Speaking on behalf of the House of Commons, in reply to the toast, he said, in the presence of some 200 of the most prominent business men of the city of Montreal who were attending the banquet, that no one could for a moment think that these immense territories in the North-West would long be dependent upon one single line of railway. He thought that before we would be much older, not only two, but as many as ten lines of railway would find enough traffic in those territories to pay handsome returns to their shareholders.

Such was the opinion of a gentleman whom the Opposition, in another place, have described with great satisfaction, as not being in favour of the construction of the Transcontinental at this present moment.

Let us now examine this opinion of Mr. Blair and see if it be well founded. The revenue which the Canadian Pacific Railway is actually deriving from the half a million inhabitants of the North West is about $44,000,000,

which is equivalent to $5,000 for every mile of railway in operation under their control.

Now, the hon. member for Calgary stated in this House, the other day, that during the present year there would be an influx of settlers into the North West of about 100,000 people.

At that rate of increase, we would have in the North West, before the proposed railway is completed, another half a million people or a population of a million altogether, which would therefore furnish ample traffic both to the Canadiau Pacific Railway and the Transcontinental.

Congestion of traffic in the West.

We are aware that there has been congestion of traffic in the west and that the Canadian Pacific Railway has been unable to transport all the grain to market in sufficient time.

Now, during this last year, 30,000 homesteads have been taken, which means 30,000

farms, and it is evident that if the Canadian Pacific Railway is unable to cope with the traffic under the present conditions, the difficulty will be very much greater with those 30,000 additionnal farms, and that there is therefore urgent necessity for immediately constructing another railway to carry the grain of the West to tidal water.

Eastern section of Transcontinental. With regard to the expediency of constructing the Eastern Section of the Transcontinental, let us suppose for one moment, that a number of ourselves were given that immense territory which the Transcontinental will traverse, extending from the St. Maurice river to within a few miles of the city of Winnipeg, and north, almost to James Bay. Would we not at once form a syndicate and subscribe the necessary capital to build a railway in that country to open up our estate and enhance the value of our lands?

And this is precisely what some capitalists

would have done, as will be seen by the statement made by the Prime Minister on the floor of the Legislature in Quebec. He said that he had had an offer made to him, provided a railway were built through that country, of $1.50 per acre for five millions acres of land. This statement will give an idea of the value of that country — for if it were the useless wilderness or the improductive land that some would represent it to be, is it likely that any capitalist would have offered any such sum?

Resources of country

Now let us see what are the natural resources of this immense territory which lies chiefly in the Provinces of Ontario and Quebec.

In the Province of Quebec, the country is particularly well known: it is nearly all good and well timbered land.

There is a large amount of pulp-wood and the pulp industry in Quebec is growing enormously.

For instance the Laurentide Pulp Company

at Grand'Mère, where two and a half million dollars have already been spent, and an additional million is being spent this year, is doing so well, that the company is able to pay a dividend of eight per cent on its common stock. The pulp-wood which is used at Grand'Mère is drawn from the valleys of the St. Maurice and Mattawin rivers, precisely from that region which the Transcontinental will traverse. At the sources of these rivers, there are splendid meadows awaiting cultivation; only small portions of them being tilled to provide wheat for the men who are carrying on lumbering operations there.

Fertility of northern slopes of Laurentian range.

I would like to give the hon. members some further idea of the fertility of the northern slopes of the Laurentian range.

The colonisation of that part of the country had been impeded for years and years owing to the fact that our colonisation societies have

confined their endeavours to the colonisation of the strip of land which lies between the foot of the Laurentian range and the St. Lawrence, and which is only 30 miles in width, till it merges into the Laurentian range at Quebec. But once the Laurentian range is crossed, a rich clay belt is reached where colonisation has been successfully carried on, though on a very small scale, for many years past. For instance, the parish of St. Zenon, which I visited last year and which is properous at the present time, was established by one enterprising parish priest who, seeing under the old conservative regime, the people leaving the country and going to the States to work in factories and so on, and finding it impossible to colonize and establish good farms in the Laurentian hills, was courageous enough to cross the range some thirty miles and establish in the northern slope of the hills the parish of St. Zenon.

Another priest took his flock some twenty miles further north of that parish, and there

established another parish, St. Michel des Saints, which I also visited last year and which is situated on the Mattawin river.

Parishes 70 miles from nearest railway.

I regret having to allude to personal experience, but as the hon. leader of the Opposition stated that he had seen Bute Inlet and other places on the Pacific coast, I would ask the House to allow me to state what I have seen.

The Parish of St. Michel des Saints is seventy miles north of the St. Lawrence. I see one member of this House who represented the very county in which St. Michel des Saints is situated, and I am sure he will bear me out when I say that it is seventy miles from the nearest railway, and it is, at the same time, a prosperous parish and the fertility of the soil is so great, that these people, settled seventy miles from a railway, can live comfortably, manufacturing cheese and butter, although they have to carry their produce at St. Felix de

Valois, the nearest station, and everything they use, agricultural implements and the rest, has to be teamed over a wagon road from that station. These parishes are about thirty miles distant from the proposed railway, but it is not unlikely that the line will pass much closer to them.

Great level tract of country.

I was told, when I visited those parishes, that the country is quite level for a distance of over a 100 miles towards the north, and this statement is corroborated by the mail carrier for the Hudson Bay who travelled over that country over and over again; and also by the reports of the Geological Department. It is therefore somewhat surprising to hear an ex-minister of the conservative government, the hon. Mr. J. H. Haggart, declare that this is a land of granite ridges and unfathomable muskegs.

I wish most publicly and with the certainty of an eye-witness to give a most explicit denial to that statement—and I am fully aware

that every word an hon. member utters in this Chamber should be most carefully weighed—in order to dispel any idea that may exist that the line along this route is not of the very best, and that the crops raised there are not equal to those of any other district.

And why should it not be so?

No one will deny the fertility of the farms in the Lake St. John district, and there is no point on the Transcontinental as far north as Lake St. John.

Climate similar to that of Manitoba. The eastern section of the Transcontinental follows roughly the 48th parallel which passes about 140 miles south of Winnipeg; and judging by the isothermal line, the climate along that parallel should be about the same as that of Winnipeg, and the snowfall about equal.

In Ontario, it follows approximately the 50th degree of latitude which is that of Winnipeg, and the same remarks apply to that section.

Now we know that wheat and other cereals

can be grown in the latitude of Winnipeg and it is therefore quite clear that it can be grown all along the route of the Transcontinental.

Description of route of Transcontinental.

Now I come to the fourth question with which I wish to deal: the selection of the route which the Transcontinental will follow.

The criticisms with regard to the location of the line form certainly the burden of nearly all the speeches made in the other House, and probably the same criticisms will be heard in this House.

Let us examine the route selected. We all remember the long debate that took place as to the advisibility of selecting Moncton as the starting point.

It was finally decided that Moncton being situated in the heart of the maritime provinces, that was the place from where it should start.

Moncton to Edmundston.

The Intercolonial Railway starting from Monc-

ton could not be followed, as it makes such a wide detour to the north and does not furnish a direct route to the west; consequently, the route running directly from Moncton to Edmundston was adopted.

A route through that part of the country was actually surveyed as far back as eighteen years ago — and the hon. senators from New-Brunswick will bear me out in this — when I state that very easy gradients were obtained.

It has always been a mystery to me, in looking over the map of New-Brunswick, to see that immense territory, through which the Transcontinental will pass, almost untouched by the hand of man although it possesses excellent timber, and every facility for carrying on extensive lumbering operations.

Moreover, if we are to judge from the speeches of the representatives from that province, and from official reports, the country is not only rich in timber, but the soil, for the greater part, is fit for cultivation.

The opening of a line from Moncton to Ed-

mundston will supply a long felt want and will shorten the distance from Moncton to Quebec some 75 or 80, or even perhaps 90 miles. The actual distance saved will depend on the allowance which the engineers will make for curvature.

Edmundston to Levis. From Edmundston, the line skirts the northern boundary of Maine which so awkwardly encroaches into Canada, and reaches the county of Temiscouata; and here passes through a country which is being rapidly settled and calls for railway facilities. From Temiscouata to Levis, the line follows the fertile strip of country which lies in the rear part of the counties of Kamouraska, l'Islet, Montmagny, Bellechasse and Levis. The idea of building a railway along the back of these counties is not a new one, for this parliament has already granted a charter to the Quebec and New-Brunswick railway; and another charter is being asked this year, I believe, in the interests

of McKensie and Mann to build a railway through that country.

I see the hon. gentleman for Stadacona smiling; he knows perfectly well that there is a large quantity of very good land in the rear of the county of Montmagny which he had the honour of representing in the other House; good fertile land situated some 25 or 30 miles from the St. Lawrence; and in the county of l'Islet, which my father represented in the Commons for nineteen consecutive years, there are parishes of importance, settled parishes, which are 30 or 40 miles from the nearest railway.

If the inhabitants of those parishes had had advocates in this House as energetic as some representatives of the North West, they would have clamoured long ago for a railway.

Quebec to the St. Maurice. The most difficult part of the road to construct will probably be from Quebec to the river St. Maurice, the country being very rough

and mountaneous, especially for a distance of 90 or a hundred miles from the St. Maurice.

The country however is not impassable, as two railways have already been built in that region: namely the Quebec and Lake St. John and the Canadian Northern.

It will probably be necessary to spend a considerable amount of money to obtain easy gradients through that difficult section of the country, but once the St. Maurice river is crossed, we reach a magnificent plateau which, according to the reports of the Geological Survey, extends north and south for over 100 miles, and over 900 miles east and west, and over which easy gradients should be obtained at comparatively small cost.

From the St. Maurice to Winnipeg the line will follow this great table land and will pass south of Lake Abittibi.

Speaking of Lake Abittibi and that country, in 1888 I was sent out by the Ontario government to lay out the township of Evanturel on the Blanche river which is 30 miles south of

where the Transcontinental is intended to pass; and any one who has seen the adjoining townships: Guigues, Duhamel, &c, will know that there is no place in the province of Quebec where better hay, better wheat, better oats or better grain of any kind can be grown than at the north end of Lake Temiskaming.

The same may be said of the two provinces, for Lake Abittibi lies partly in the province of Ontario; so what applies in this respect to one province applies to both.

This will give some idea of the latent wealth of the district which this section of the Transcontinental will traverse.

The great table land. The great table land I have mentioned above, containing an area of some 50,000,000 acres or 250 townships, is reported to be perfectly level from the St. Maurice for a distance of 600 or 700 miles to the West; the greatest difference of level in this great clay belt being less than 200 feet.

Admitting that it is double that, say 400 feet, in that distance it would be equal to about one foot a mile, which in railroading is practically level.

Cost of transportation of wheat.

If the road can be located along that table land, and such easy gradients can be obtained—and they will be obtained if the reports of the geological department of the Ontario and Quebec governments give the correct altitude—it will be possible to carry grain very cheaply, for the cost of transportation depends on the gradients.

Advance in Railway transportation.

Within the last twenty or twenty-five years, the advance which has been made in railway transportation is enormous. Some twenty years ago a train carrying 600 or 700 tons was supposed to be a heavy train. Today, on the Canadian Pacific Railway, a train carries up to 1,500 or 1,700 tons.

Look at what the United States Steel Corporation is doing, in carrying ore from Lake Erie to Pittsburg.

This corporation purchased an almost abandoned road, straightened it out, strenghtened the bridges, eased off the curves, put down 100 pound rails and used tremendously powerful locomotives. I saw, the other day, that they used locomotives of 200 tons. I doubt it very much; but they are certainly using locomotives of 120 tons hauling to Pittsburg on a down grade, with each train load, 2,600 tons of ore.

If our railway be built with such gradients, there is no reason why grain could not be carried from the west and delivered in the city of Quebec at rates to compete with other routes.

I have given this subject mature consideration. I have talked a great deal about it with many grain men in the city of Montreal, and I really believe that when this road is in operation — and as I said the only part of the

line that present any difficulty is from St. Maurice to Quebec, and that is down grade—there will be no difficulty in carrying grain to Quebec at a rate of something better than twelve and fourteen cents a bushel.

Comparison of rates by rail and water.

I may say that there is not much difference between the price I have named and the price actually charged by water.

Wheat can be carried from Winnipeg to Port Arthur for 6 cents a bushel via Lake Superior; and via Georgian Bay as far as Depot Harbour, for some 2 cents a bushel, making 8 cents a bushel from Winnipeg to Depot Harbour.

From Depot Harbour to Montreal Mr. Booth, has carried grain on his railway at rates ranging from four and a half cents to two and a half cents a bushel and in taking it to Montreal, he had to offload it at Coteau and carry it some forty-two miles by water.

But notwithstanding this transhipment, the cost was only two and a quarter cents a bushel in some instances; and in others four and a half, making a total cost of about 10 cents a bushel from Winnipeg to Montreal by the rail and water route.

I do not wish to say that wheat can be carried as cheaply by rail as by water. Given a long stretch of water, the freight by water should be about one sixth of the freight by rail, that is, provided there are no transhipments.

But there are other points to be taken into consideration in the case of a water route; for instance, the marine insurance which is very high, and the shortness of the season; for it must be remembered that the working season is limited to seven months and that any grain left over at the close of navigation will have to bear five months interest in addition to the cost of storing it until navigation reopens. The railway in the other hand, can carry grain throughout the whole year.

I regret I have no time at present to dwell at any length on the relative cost of transportation by rail and water, but must leave this question for another occasion.

Profiles of G. T. R. and C. P. R. I hope next session that we shall have before us the profiles of the Grand Trunk Pacific and Canadian Pacific Railways so that the hon. members will be able to realise at a glance the striking contrast between the gradients of these two railways, and will at once understand why it will not pay the Canadian Pacific Railway to haul grain at rates which will bring a fail return to the more modern road.

Faulty location of C. P. R. It has always been a matter of surprise to me, that the eastern section of the Canadian Pacific Railway should have been located where it is. If a difficult route had been looked for, I do not know where a more difficult one or one traversing a greater portion of poorer country could have been found.

We know that the country is so devoid of resources, that from North Bay to Sudbury all the way up to Port Arthur, the local traffic is next to nothing, and from Thunder Bay westward up to the Kaministiquia river to Lake of the Woods there is also an absence of local traffic.

There may have been good reasons for selecting this route: one of them being the difficulty of getting supplies into that country at that time, and it was therefore necessary to be near navigation, near Nipigon Bay and Thunder Bay, in order that supplies could be brought in for the surveyor and engineers who were going to locate the line, and for the men employed on construction.

Personal experience

I speak from personal experience, for, in 1874, I was employed on the survey of the Canadian Pacific Railway from Lake Shebandowan towards the height of land about a 100 miles south of where the Transcontinental will pass.

Later on, I was employed on the construc-

tion of the Railway, and it was rock cut after rock cut, steep grades and sharp curves, &c.

The cost of building that road was enormous: the hon. McHaggart stated in the House of Commons that it must have cost something like $60,000 a mile, and I have no reason to doubt it.

While on the subject of my personal experience, I may mention that in 1883, I spent the whole summer in the neighbourhood of Long Lake, in that part of the country which the Transcontinental will traverse; and I also travelled from there to the elbow of the Saskatchewan, some seventy miles south from where the Transcontinental is to pass, and I know that it will be very easy to build a railway through that country.

It was somewhere near there that the old McKenzie route was projected. Throughout the whole of that district, the prairie is dotted about with clumps of trees, a promising indication that it is an excellent country for settlers.

Sources of information. I have drawn my information on the Transcontinental from the blue-book entitled : " National " Transcontinental Railway ; resources of the " country between Winnipeg and Quebec along " the line of the Grand Trunk Pacific ", with map attached ; the map is divided into 12 sections, and shows the location of the road ; the elevations are marked on these maps, and I see no reason why the proposed line could not follow, at least within a reasonable distance, the route indicated on the plans.

I have also consulted the numerous official reports and the detailed information, collected with much care for every mile of the road from section 1 to section 12, that is from Quebec to Winnipeg.

Terms of contract with G. T. P. I now come to the conditions of our contract with the Grand Trunk Pacific Company. I think it is the best agreement any government has ever made ; and my only surprise is

that the Grand Trunk Railway was so anxious to enter into such an agreement.

Section west of Winnipeg. So far as the section west of Winnipeg is concerned, there is no comparison between our contract with the Grand Trunk Pacific Company and what the late Government granted to the Canadian Pacific Railway.

The Canadian Pacific Railway was given some 25,000,000 acres of land. Not a single acre of land is given to the G. T. P. by this contract, except what is necessary for the right of way.

The C. P. R. also received $25,000,000 of public money; not a single dollar in cash is given to the Grand Trunk Pacific. But all the government does is to guarantee a portion of cost of constructing the road.

Government guarantee. The total guarantee amounts to 75 per cent or three quarters of the bonds, and the Grand

Trunk Pacific Company have to supply the other 25 per cent. That is to say if the road cost $16,000 per mile, the government guarantee on the bonds will only be to the extent of $12,000. The remaining $4,000 will stand as a second mortgage on the road.

But it has been said that the Grand Trunk Pacific will never pay the interest on their bonds. The Government has a security in the assets of the Grand Trunk Railway Company amounting to $150,000,000 besides the road itself, the guarantee being only three quarters of the value of the road.

The total sum chargeable to this country, as Mr. Fielding, the minister of Finance, has stated in another place, will be $14,000,000. The hon. Secretary of State in this House estimates the cost at $19,000,000 or $20,000,000, this amount to be spread over a period of ten years, thus making the burden on the people of this country some two millions a year for ten years.

At $14,000,000 it would simply mean the surplus of one year; and if we take the extreme

figures furnished by the hon. Secretary of State, it would take a year and a half's surplus to pay the whole amount.

Guarantee for prairie and mountain sections.

For the prairie sections, the government guarantee is $13,000 a mile, and for the mountain sections $30,000 a mile. It would naturally be in the interest of the Grand Trunk Pacific Company to have as many miles as possible of mountain sections.

But the contract provides that the point where the prairie section ends and the mountain section begins shall be determined by arbitration and this is perhaps the reason why the hon. Secretary of State was not exactly certain of the absolute mileage of the prairie section, because the point where the mountain section begins is not easily defined.

The Grand Trunk Pacific Company might be inclined to put it as far east as possible, while it would be the duty of the Government to put it as far west as possible, and in case

of a failure to agree, it is provided in the contract that a commission of experts or arbitrators shall be appointed who will define exactly how many miles there shall be at $13,000 a mile and how many miles at $30,000.

The section west of Winnipeg concerns us very little. The Grand Trunk Pacific Company are building and paying for it themselves. The section which concerns us most is the one east of Winnipeg, that portion which is to be a national highway and on which every railway will have an equal right of way.

Eastern section a National highway.

When it was first suggested that this section should be a national highway, I must say I was astounded; I have had a little experience in railway management, I did not think at the moment it would be possible for a railway to be operated on those lines.

I have heard the ex-minister of railways, Mr. Blair, a man for whom I have a great

respect and who has proved himself a very able railway manager, make light of this joint operation of the railway. And I must say there are some railway experts in this country who are not friendly to the project, who believe it will be impossible to operate a line under such conditions.

But it has been demonstrated satisfactorily that this system will not give rise to much difficulty. In the United States, many roads are operated on the same principle.

Appointment of Railway Board. A Board will be appointed as soon as the traffic will warrant it, and the Government having absolute control over the line from Winnipeg to Quebec, will be in a position to dictate the terms under which every train shall be operated.

It is scarcely necessary to go into details to explain the nature of the duties of this future Board, for it will follow the well known procedure which is at present adopted by the

Railway Committee of the Privy Council, when granting to a company running rights over another company's road, and determining the amount which the one company should pay to the other for this privilege.

Alternative proposal. Lastly, I should like to say a word with regard to an alternative proposal, which has been made in another place, and which will probably also be brought before us.

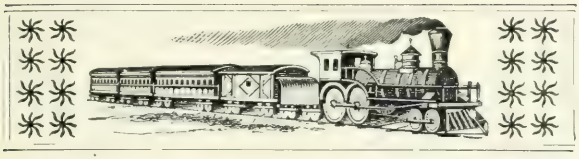
It has been suggested that instead of building this Transcontinental line, it would be better to extend colonisation roads from the existing railway at intervals of 100 miles and extending 100 or 150 miles north. Why, if theses branches were built, their aggregate length would equal the Transcontinental and there would be no Transcontinental at the end of it all. It is self-evident, that these branch roads, running north like blind alleys, can never accomplish what one grand Transcontinental road can do.

There will necessarily be some lines constructed to connect with the south, say, at distances of 400 miles apart; for instance a railway is being built by the Ontario government, the Temiscamingue railway, which will doubtless eventually connect with the Transcontinental; but the proposal of the Opposition may be safely dismissed as totally impracticable.

In conclusion, permit me to add that if we could remove the veil of the future and see what will be the condition of this new kingdom twenty years hence or fifty years hence, when this lease will expire; if we could see the towns and villages that will be settled along this grand National Transcontinental line, if we could see the enormous industries that will have sprung in the districts through which the road will pass, we would in some measure realise the immense service the present administration has rendered to our country; and I venture to say that when the history of this administration is written, and when the life of

the distinguished statesman, who now rules the destinies of Canada is ended, and he has disappeared from the turmoil of politics; then indeed the brightiest page in all his life's history will be the one, when he first united the hearts of the people of his country, and the next one, will be when he joined the provinces of the Dominion by this long solid continuous link of steel, the National Transcontinental Railway.

THE
NATIONAL TRANSCONTINENTAL
RAILWAY



The National Transcontinental Railway

Speech delivered in the Senate on the 17th June 1904

I deeply appreciate the honour of being intrusted with the privilege of replying to the hon. leader of the Opposition on this occasion, for the measure now before the House is, in my opinion, the most important which has engaged the attention of Parliament since Confederation. It provides for the construction of the greatest railway ever contemplated in this country, a vast enterprise which, when complete, is bound to exercise a powerful influence on the

future of this young nation. It is therefore with considerable diffidence I rise to undertake the important task intrusted to me.

I propose to deal, first, with the proposed amendments to our contract with the Grand Trunk Pacific Company; secondly, to say a few words about the previous endeavors which have been made by our predecessors to construct a Transcontinental Railway; thirdly, to discuss the question of the cost of transportation; fourthly, to describe the resources of the territory traversed by the Transcontinental, and lastly, to say a word on the project of the leader of the Opposition.

Agreement with Grand Trunk Railway.

I shall deal very briefly with the amendments and ask this House why we are again considering this Bill. Why are we amending the contract passed last year? If the agreement was not to benefit Canada, but to benefit the Grand Trunk Railway Company, — as the press and the leaders of the conservative party

have endeavoured to prove, — why was it rejected when it was submitted to the shareholders of the Company in England, by one of the ablest men of the Company? Why did the shareholders refuse to give credence to the statements of the conservative party and why did they reject the agreement?

Rejection of the agreement by the shareholders

The president and board of directors were almost unanimously in favour of the contract, but one of the shareholders, an old director of the Company, Mr. Allen, absolutely refused to have anything to do with the agreement, saying he refused to plunge once more into the wilderness; that the Grand Trunk Railway Company had lost enough money in Canada, and they were not going to enter into this new enterprise. He sent a memorandum which was read by his own son at that meeting, giving the reason why the Grand Trunk Railway shareholders should not ratify the agreement as it stood then. This

reminds me that, last session, I was discussing the question with some friends and saying that were I one of the shareholders, I would certainly think twice before I would accept the contract, and I gave my reasons. I happened to do so within the hearing of a high official of the Grand Trunk Railway, and he asked me to refrain from giving those reasons when addressing the Senate on this subject.

He said that Mr. Hays would find it difficult enough to persuade the shareholders to ratify the agreement, without placing further obstacles in his way. But I find that many of the shareholders in England entertained the same opinion as I did, and at the meeting held to consider the question, the same arguments that I had used were urged by the shareholders against the ratification of the agreement. Mr. Merlin, a large shareholder, in the Grand Trunk Railway Company, said that he found, after reading the contract carefully and submitting it to business men in London, that the Canadian Government were assuming little

or no obligation, and I invite the attention of this honourable House particularly to this fact that the business men in London take the same view of the contract as our Finance Minister.

Amendments to agreements. (*a*) Extension of time.

The first amendment to this agreement is the demand for an extension of time from five to eight years. The agreement stipulated that a deposit of $5,000,000 was to be made and business men, before subscribing this capital, wanted to make sure that the Company would have sufficient time to complete the enterprise, and hence insisted upon an extension of time.

In doing so they acted as business men; that is, their intention was not to avail themselves of the total time allowed, but to perform the work as expeditiously as possible, with the view to saving as much interest as possible on the large capital invested in the construction of the road, which must necessarily lie

dormant until the line is practically complete. I do not consider that the extension of time is of much importance ; and this amendment, as the hon. Secretary of State has said, is therefore of very little moment.

(*b*) **Operation of completed portions.**

Secondly, the Company asked the right to operate the constructed portions of the railway as soon as they are ready for use.

That is a reasonable request. What would be done with those portions of the railway if they were not so operated, for it is not the policy of this Government to operate the railway. Our hon. friends in the Opposition have altered their opinions lately about the operating of railways by the State, and would have the Transcontinental operated by the Government. But it is not the intention of this Government, as the Finance Minister has stated, to operate the road, and therefore it is only right to allow the Grand Trunk Pacific Company to operate the completed sections as they become fit for

use, and all the more so as the Grand Trunk Railway Company will have to pay for the whole of the rolling stock, and they will be operated without any expense whatever to the tax-payers of Canada.

(*c*) **Provision for bonds selling below par.**

The amendment relating to the prairie section is very slight. While this agreement was being presented to the Grand Trunk Railway shareholders, the financial market of the world was depressed, and it was feared that these bonds would not be taken up at par. Therefore the Company is now asking the Government to make some provision for the difference in case the bonds should sell below par. I must remind the House that the bonds cannot be sold without the sanction of the Finance Minister, in other words, the Government of Canada.

Even admitting that it would become necessary to issue more bonds to make up the $13,000 per mile, in the event of their selling

at 10 per cent below par — which I am not prepared to believe, for I have more confidence in the credit of Canada — these additionnal bonds would only involve a further guarantee on the part of the Government, but no actual disbursement.

(*d*) **Government guarantee for mountain section.**

The hon. gentleman opposite has criticised that part of the agreement which refers to the Mountain section from Edmonton to the Pacific. He stated that there was no limit to the Government guarantee; but he must be perfectly aware that there is a limit namely: the actual cost of the road. Moreover it will rest with the Government engineers to determine the actual cost, as in the case of any company applying for the double subsidy. The Government engineer will inspect the road, and the Government is perfectly justified in saying: we will guarantee the bonds on a

road costing $40,000 a mile — that is guaranteeing the bonds for $30,000.

The hon. gentleman opposite made a great deal of the fact that it appeared to him that the estimate of the cost of constructing the road through the Rocky Mountains was too low. I am not at all prepared to contradict him on that point. But I would call his attention to the fact that the section between Edmonton and Port Simpson includes three hundred miles of prairie which will obviously greatly reduce the average cost per mile for the total section. Therefore, the Government in agreeing to guarantee bonds to the extent $30,000 dollars per mile on the mountain section does not seem to be incurring an undue risk.

Acceptance of agreement. The Government found themselves face to face with this problem: either to agree to the amendments I have just mentioned, or else abandon the idea of having the road constructed

by the Grand Trunk. There was no other alternative. And I consider that the Government made a very good bargain with Sir Charles Rivers-Wilson and Mr. Hays, in spite of a good deal of opposition.

Previous endeavours to construct a Transcontinental railway.

The hon. leader of the Opposition should remember this is not the first time that the Government of this country has applied to the Grand Trunk Railway to build a transcontinenta lroad. I may say — and it is a matter of history now — that the colleagues of my hon. friend, Sir John A. Macdonald, Sir Charles Tupper, Sir Leonard Tilley and Sir Adolphe Caron, approached the Grand Trunk Company before making an agreement with the Canadian Pacific Railway. But they were not so fortunate as the present Government, for I have been informed that although the gentlemen I have named went to London and tried in every possible way to

induce the Grand Trunk to do for them what they are doing today for Laurier's government, they did not succeed.

They eventually entered into a contract with the Canadian Pacific Railway; and now let us examine the terms of that contract.

Canadian Pacific Railway contract. The Canadian Pacific received twenty-five millions of the people's money in addition to twenty-five million acres of land, and 614 miles of constructed road, besides surveys from one end of the line to the other; they also were granted exemption of duty on anything they imported from the United States or elsewhere for the construction of the road.

They were exempted from land taxes, and lastly, what is most important of all, they secured a monopoly, for they were free from any railway competition, and given the right to charge their own rates in the Northwest or wherever their line went.

Therefore it came to this: that merchants

or settlers had the option either paying what the Canadian Pacific Railway chose to charge or not make use of the railway.

History of the $30,000,000 loan. After the Company had been granted all these concessions, they asked for a loan of thirty millions of dollars; but Sir John A. McDonald, knowing he had done so much for them already, hesitated and said: "I have gone so far that I am really frightened to go one step further." The minister of railways, the hon. Henry Pope, refused to help them; and Sir William Van Horne in despair applied to the Railway department for assistance. But Sir Charles Tupper also refused help, for he thought the Government could not give anything more, as they had given the Company everything they could. But Sir Francis Smith insisted that they must be helped, as the Government could not allow this great enterprise to be abandonned.

Sir Francis Smith received a knighthood

about this time; and it came out in a letter published over Mr. Van Horne's signature, in a Montreal paper, that Sir Francis Smith had saved the Canadian Pacific Railway from brankruptcy.

The money was loaned, and every dollar was returned and the Canadian Pacific Railway Company today occupies a position of pre-eminence among the great corporations of the world, and has, under the management of such able men as its Chairman, Sir William Van Horne, and its President, Sir Thomas Shaughnessey, largely contributed to the prosperity of Canada.

The difference between the very generous concessions granted by the late Government to the Canadian Pacific Railway and the terms of our agreement with the Grand Trunk, is so striking that comment is needless. I will only mention one point, namely that in our agreement, the Government retains absolute control of the rates; a condition which alone

would justify them in incurring expenditure to further this great enterprise.

Question of transportation.

Now, to pass on to the question of transportation. The hon. leader of the Opposition has asserted that grain would not be carried on the Transcontinental, especially during the summer months.

This question of transportation is of such great importance that the members of this House who take an interest in public affairs will, I am sure, grant me a few minutes attention to discuss it.

Before stating my own opinion on this subject, I will put before the House two widely different opinions from two men who have given a great deal of thought to the question.

Two different opinions.

The first — a gentleman who was very prominent in the Government at one time — says: "Improve the waterways, improve the rivers and

canals, that is the best means of transportation. The hon. gentlemen will know very well to whom I refer: J. Israël Tarte, who warmly advocated that policy against the building of a railway. The other, Mr. Robert Meighen, president of the Lake of the Woods Milling Company, when giving evidence, a few days ago, before the Transportation Commission, in Montreal, said: "Gentlemen, not one cent should you spend on the canals: the canals are antiquated, and you must change the climatic conditions of Canada if you are going to work on canals. Canals are a thing of the past. Build up your railways."

I consider Robert Meighen's opinion, as far this question is concerned, at least equal to the opinion of Mr. Tarte.

Rail versus water transportation.

I, in my turn, do not pretend that the all-rail route from the West can compete successfully with water carriage. It is, of course, cheaper

to carry freight by water than by rail. That is an axiom.

Given a long voyage, say, across the Atlantic, it will cost one-tenth less to carry freight by water than it will by rail; that is, leaving aside the question of putting the cargo on board ship, and also other considerations which greatly affect the cost of transportation and to which I referred when adressing the House on this subject in 1903, and besides, we are not dealing here with an all-water route.

Cost of transportation by rail and water route.

Now, let us see what is the cost of transporting the wheat of the West by by the present rail and water route to tidal water.

Taking Brandon as the starting point, the wheat must, first of all, be transported by rail to Port Arthur, a distance of 550 miles, and there it has to be off-loaded from the cars and stored in grain elevators, and something has

to be paid for the storage, and for the delay until the vessel arrives. Then it is put on board ship and taken across the lake to Depot Harbour or Port Colborne, where it has to be off-loaded again. Now, it may either be sent by water from Port Colborne or rail from Depot Harbor via the Canada Atlantic Ry., to Coteau where it is transferred to barges and taken down to Montreal and handed over to the Canadian Northern who take it to Quebec via Hawkesbury and Grand'Mere.

All these transhipments cost money and cause delay, and moreover, that route is only available during the summer months. It must be remembered that the grain crop must be carried out of Manitoba within a period of six weeks. The shipping commences about the 15th of October and continues till about the end of November when navigation closes.

If the wheat be kept until the spring, it costs a cent per bushel per month; if kept six or seven months, it means six or seven cents a bushel.

Elevators are required in which to store the wheat; and elevators large enough to store such a quantity of wheat as the plentiful crops of the North West will furnish, would cost some $20,000,000, and somebody would have to pay interest on that large investment.

Cost by rail and water route

Last summer the cost by the rail and water route from Brandon to Quebec, was fifteen and one half cents. With the reduced rates, it was still ten cents per bushel. I am quite willing to admit that if the Welland and St. Lawrence canals were deepened to a depth of twenty feet, the carriage would be cheaper by water; but the national debt would be doubled and wheat would still have to be stored during the winter season at considerable expense. Taking the annual crop at 100,000,000 bushels, such a quantity stored for six months at one cent per bushel a month would represent $600,000, which would be a fair interest on the cost of the railway.

Cost of transportation by all-rail route.

Let us now see what is the cost of carrying from Brandon to Quebec by the all-rail route, taking a train load at 2000 tons or 60,000 bushels, and the distance at 1,600 miles. The cost may be arrived at in this way: Putting a train at $1.25 per train mile, plus one third for hauling the empty cars back, and adding two or three cents for profit, the cost works out at less than eight and one half cents per bushel.

Progress in railway transportation.

I must draw the attention of the House to the fact that transportation by rail has undergone an immense change. The cost all depends upon the gradients, for on a practically level road, a locomotive can haul an immense load. In fact, given a gradient of three tenths of one per cent, or four inches per hundred feet, or sixteen or seventeen feet to the mile, a locomotive will haul exactly twice

the load which it could haul on a one per cent gradient or fifty-two feet to the mile.

Tables show that there is no advantage in having a road more level than three tenths of one per cent, because the necessary energy required to start a train on a level tract is sufficient to pull a train up a grade of four inches in a hundred feet. Consequently, if the Canadian Pacific Railway with its comparatively heavy gradients, can haul grain at twenty cents per bushel, it should be possible, on a modern road with easy gradients, to carry it for half that price.

But when I speak of a railway with a gradient of four inches to the hundred feet, some hon. gentlemen may say: "This is not possible, no railway is built like that. You cannot point to a single road in Canada with such gradients." If the hon. gentlemen will only take the trouble to inquire, they will find that the Grand Trunk Railway Company of Canada have so reduced their gradients that they have to-day a road on which, going east, there is no

gradient between East Toronto and Montreal of more than four inches in 100 feet or seventeen feet to the mile. There is, it is true, a gradient leaving Toronto going to York or east Toronto, steeper than that, but the heavy trains are made up on the east side of Toronto after the line has risen from the level of the lake.

Mr. Charlton's remarkable speech. I read carefully Mr. Charlton's speech in the other House on the Transcontinental and thought it at first, in some measure exaggerated, for I was of opinion that it would be impossible to construct a road with such gradients at the cost he mentioned, and haul grain at such low rates.

But the information that I have gathered since last session and the close study I have made of the question, lead me to believe that Mr. Charlton's speech is substantially correct. It shows what care this far seeing man must have given to the study of this question, to

have been able, twelve months ago, to have made a prophetical speech, which to-day is becoming a reality.

Selection of route. A great deal has been said about the construction of the Transcontinental, and much criticism has been heard concerning its length between Winnipeg and Quebec.

Let us examine these criticisms.

The original proposal was to build the line from North Bay to Winnipeg, and thence westwards to the Pacific ocean. But the Government considered it would be preferable to avoid North Bay and to construct the line direct from Winnipeg to Quebec. The objection was raised that this would add greatly to the length of the line, but such is not the case.

The total distance by the new route from Winnipeg to Quebec will be 1400 miles. Now the distance from Winnipeg to North Bay is

1,043 miles and had the route via North Bay been selected, it would have been necessary, in order to reach Quebec, to have gone from North Bay to Toronto, 180 miles, and from Toronto to Montreal, 333 miles; and thence on to Levis, 180, making a total distance from Winnipeg to Quebec, by this route, of 1740 miles instead of 1400.

If the Canadian Pacific route had been followed, leaving the Grand Trunk at North Bay, the distance would have been 1,596 miles, so that the Transcontinental will shorten the distance between Winnipeg and Quebec by 196 miles. And I may mention that this distance of 1,400 miles includes an allowance of about 10 per cent for curvature, as the line from Lake Abittibi to Quebec has not been finally located. The actual distance from Winnipeg to Quebec, mesured as the crow flies, is slightly over 1,200 miles; if an allowance of 10 % be made for curvature, that distance becomes little short of 1,400 miles.

Eastern Section. Winnipeg to Quebec.

I shall devote my remarks principally to that portion of the line which most concerns the tax payers, namely the section from Winnipeg to Moncton.

From Winnipeg westward, the Government is simply guaranteeing a portion of the cost of the construction, which guarantee is secured both by the Grand Trunk Pacific Company and Grand Trunk Railway with its hundred and eighty-seven million dollars of assets.

The Government guarantee is therefore perfectly secured.

Description of route.

Now, to come to the selection of the route. The route selected from Winnipeg to Quebec is as follows: Winnipeg eastward to lake Seul; lake Seul to the north of Lake Nippigon, and then eastward to the north of lake Abittibi; from lake Abittibi, still following an easterly direction, to the headwaters of the St. Maurice; and then southward down the

valley of the St. Maurice towards Grand'Mère ; and thence, leaving the St. Maurice, the line proceeds to Quebec.

The change of direction from the headwaters of the St. Maurice southward is due to the fact that the line has to cross the Laurentian range.

The great table land.

There is very little difference of level between Winnipeg and the headwaters of the St. Maurice, for Winnipeg is 800 feet above the level of the sea, and the headwaters of the St. Maurice are also about 800 or 900 feet above sea level. The country between these two points consists of an immense table land without any mountain ranges.

The highest point on this great plateau is lake Seul, the waters of which are 1,140 feet above sea level. Allowing 60 feet for the height of the shores of the lake where the line will pass, the highest point of the line above sea level would be 1,200 feet, and as the

distance from lake Seul to Winnipeg is about 400 miles, the average gradient would be about one foot to the mile.

From lake Seul, for a distance of some 800 miles eastward, the fall is only about 400 feet or six inches to the mile. No better route therefore for a railway could be desired than the route selected, for it follows the Hudson Bay and James Bay basins and passes through a splendid level country with a rich alluvial soil.

Surveyors report a splendid country. The reports which have been received from the surveyors all go to show that it is indeed a very fine country; for instance, a line has been surveyed immediately west of lake Abittibi by the Ontario Government, and levels have been taken at many points; the ground has been found to be slightly undulating but about the same level all the way and exceptionally well adapted for the location of a railway.

I have seen the plans af the Transcontinental for 248 miles east of Winnipeg, and I may mention that any other senator is at liberty to see them if he wishes. I simply went to the Grand Trunk Railway offices in Montreal, and was readily given access to these plans.

Plans and profiles of Transcontinental.

It appeared to me that the roughest country will be met with where the line passes from Manitoba to Ontario. The work there will doubtless be rather heavy, but I noticed that the gradients have been kept down to the ruling limit. I was shown both the plans and the profiles prepared to the scale of 400 feet to the inch; the same scale as that of the plans and profiles which will be deposited with the department of railways and canals and I have no reason to doubt their accuracy. They were shown to me by the chief engineer Mr. Stephens, and I spent two days examining them.

The horizontal plans give the contour lines

showing the elevation all through. On the profiles the quantities of each section are given so much rock, so much earth, &c., and the estimated price for the work.

Winnipeg to Port Simpson. A survey has been made westward from Winnipeg to Port Simpson through the Rocky mountains by the Pine river pass, and also by the Peace river pass. The distance by the latter route to Port Simpson is 1,066 miles. By the Pine river pass, it is a little shorter, but the gradients are much better by the Peace river pass.

Gradients & curves The gradients and curves from Edmonton westward are very easy; the gradient on the Eastern slope being only 26 feet to the mile, except at the summit where it will be 1¼ per cent or 66 feet to the mile.

On the Canadian Pacific Railway, the gradients, in some places, are as high as 200 feet to the mile, and it is necessary to provide

safety switches in order to prevent accidents. Nothing of the sort will be necessary on the Transcontinental. I see the hon. member for Sarnia is listening very attentively, and I am proud of it. He is aware of the difference between the load which a locomotive can haul on the Canadian Pacific Railway with gradients such as I have mentioned, and the load which the same locomotive can haul on the Grand Trunk Pacific with its easy gradients.

Degree of curvature. Down the Skeena river which runs through a gorge in the nature of a canyon, the gradients will not be quite so favourable as along the other parts of the line through the mountains.

The valley of the river is very narrow, and curves up to six degrees will be necessary. The ruling curvature on the Eastern slope of the Rocky Mountains will be five degrees and in some places four degrees.

East of Winnipeg, the curvature is very slight, the country being so level that the

maximum curvature for a great part of it will not be over two degrees.

Now I come to the resources of that great northern territory which the Transcontinental will traverse.

Resources of northern territory. The hon. member for Hastings appears to have no faith in the resources of that part of this country, although he told us that he had gathered roses at a point 1,000 miles further north.

I cannot believe that the Great Architect of the Universe could have created this immense stretch of country for no earthly purpose. We must remember that, until recently, that region was almost a sealed book, and it is not surprising that so little was known about it, for the only means of access to it were of the most primitive description: bark canoes in summer, and dog sleighs in winter.

Now, however the veil has been removed, and surveyors have explored the country and

we can, from their reports, form some idea of its vast latent wealth. Yet the Opposition would deny us the means of access to it and would still have us depend on the primitive modes of communication I have mentioned.

I might also mention another point to show the expediency of immediately constructing the Transcontinental:

We know that there has already been a very large influx of settlers into the Northwest and that if it continues at the same rate for a few years, the distribution of the population of this country will be completely altered. The older provinces in the East will gradually lose their controlling power which will pass into the hands of their younger sisters.

It is high time therefore that we should bestir ourselves in the East and open up our great northern country.

Transcontinental needed to open up Eastern Canada.

The construction of the Transcontinental will be the means of bringing

settlers into that part of eastern Canada as well as into the Northwest. The West, as I have said, has some 5,000 miles of railway. Why then deny the East a couple of thousand miles built with Government assistance? Why should the Government hesitate to build this line from Winnipeg to Moncton? They have a tenant for their property for fifty years. Would any hon. senator hesitate to build a house, a store, a warehouse, an elevator, or anything whatever, if he were sure of a tenant for fifty years? And the Government are assured of three per cent on the money they invest. Let us remember that Manitoba has been opened up largely with money from Ontario and Quebec, and that its effect has been to depreciate the value of property in those two provinces. Why not now, in a spirit of fairness, when the country is prosperous, throw open large sections of Ontario and Quebec to settlers? It will only be an act of justice to those provinces.

Transcontinental equivalent to a Provincial subsidy.

We have seen the Premiers of these provinces here seeking a readjustment of the provincial subsidies. Why, the construction of the Transcontinental will be equivalent to giving them an increased subsidy, for the land through which the railway will pass will necessarily acquire a very considerably enhanced value.

Let us take for instance the land for a depth of only two townships on either side of the line, and consider what it will represent in money.

A depth of two townships is equivalent to about 15,000 acres per running mile, and we know that land so situated is worth $3.00 an acre; but assuming it to be worth only $2.00 an acre, it will still mean that every mile of the Transcontinental through Ontario and Quebec will add $30,000 to the Treasuries of those Provinces, which will go very far towards solving the vexed question of the Provincial subsidies.

But we are told that this northern country possesses no resources nor good timber. In answer to this, let me read out to the House an extract from a report concerning the forests through which the line will pass.

Forests traversed by Transcontinental.

First, we know it is the natural home of pulp wood and pulp wood will do as much for Ontario and Quebec as pine did in its palmiest days. The country is full of pulp wood, and with our immense water powers, we can become the paper makers of the world, and that will be a great source of revenue.

A great part of the material for the construction of the road will be found in the country — the ties, timber for trestles, and perhaps a great deal of material for permanent structures. It will only be necessary to import rails and explosives; the rest will be found in the country itself and, as I have just explained, a large proportion of the cost will be met and paid for by the country itself.

Varieties of timber

Now, as to the timber, white elm and white pine are found as far north as latitude fifty-two which is one hundred miles or more north of this line. Red pine is found equally far north, black ash up to latitude 53, cedar and black pine up to sixty, balsam, balsam fir, canoe birch, common poplar in enormous quantities and as large as ten inches in diameter, balm of Gilead, tamarac and also black spruce, excellent for spars and masts of small boats, white spruce, which is a great rival of our pine, and which is in great demand in England and sells for nearly as much as pine; all these are found in abundance up to latitude 62, or 700 miles north of the average location of this line.

You will find on Carry lake white spruce 29 inches in diameter at two feet from the ground and 18 inches in diameter is quite common.

I shall not worry the House with the description of the mineral wealth of that country, but

Mineral wealth.

we know that it contains great quantities of hematite, iron, coal, copper, mica, and on the Isinglass river there is a beautiful quarry of mica, which was opened in 1685, about the time Father Albanel visited that country, which shows how long it has been known. The sooner we take possession of our northern heritage the better.

The lumber alone would pay for the building of the Railway. If that country were given to a syndicate, they would hasten fast enough to open it up with a railway and give value to their property. Surely the Government of Canada is able to do what an ordinary syndicate would be glad to do.

Government ownership of railways.

I now come to the question of Government ownership of railways. The hon. member for Hastings said last night — and he followed it up with a motion to the same effect — that he wants the railway owned

and controlled by the State. That means, I suppose, operated by the Government.

That reminds me of a speech the hon. gentleman made in the House last year. It will be found at page 1384 of last year's debates. He said on that occasion: "I am opposed to Government ownership of railways and I pray to Heaven may God protect us from the financial results that would accrue should the railway be run by the Government". Such was his prayer, and I join with him on this occasion in the prayer which he made in all sincerity last year. The hon. gentleman continued:

"The Intercolonial Railway would be better run by the Grand Trunk Railway, or by the Canadian Pacific Railway in every way." The Lord evidently has heard his prayer, because the Government will protect us from the dire results which he anticipated from Government ownership. The hon. gentleman for Hastings has been converted. Well, praying always brings conversion.

Some hon. gentlemen say that his conver-

sion was simultaneous with that of Mr. Haggart of the House of Commons. I do not know whether these two gentlemen like each other so much that they absolutely entertain the same views on all questions.

The project of the leader of the Opposition.

Lastly, I should like to say a word with regard to the project of the hon. leader of the Opposition in the other House. It was a great project, but it did not meet with the nourishing sunshine of public approval — and by unanimous consent, it was committed to limbo, the quiet abode of the souls of those who die before coming into the world.

His idea was to prolong the Intercolonial railway to Georgian Bay and then to follow the coast of Georgian Bay to the Canadian Pacific railway, and acquire that portion of it, as far as Port Arthur, on which grain cannot be carried at a profitable rate. From Port Arthur, his idea was to take either the Cana-

dian Northern or the Canadian Pacific to Winnipeg, and after that I do not know where he would stop with his project, but I suppose he would not go beyond Winnipeg. That idea was for a winter route only, for in summer it would not have answered, as the grain in summer would come via Lake Superior in the usual way as it does to-day. His project, as I have said, did not meet with favour; it was rejected. Had it been carried out, and had the Canadian Pacific Railway been able to unburden that unprofitable portion of their road on the tax-payers of Canada, they would at once have built another line along the present location of the Government portion of the Transcontinental Railway. If they had not built it, it would have been constructed by McKenzie and Mann. Their chief engineer, Mr. Sinclair, when I asked him if he was going to build it, said: "The Government are going to build where we would have built, north of the Laurentian range, and through that level country."

Conclusion.

If Providence will but permit me to waft away the roseate mist which dims the horizon of the next two decades, so that the hon. gentlemen could gaze with their own eyes beyond the Laurentian range over that incomparable and boundless region of rich alluvial soil, the future home of millions of christian people, then might they exclaim like the ancient prophets, of biblical lore: « What is this new Canada rising from the wooded wilderness surging from the primeval forest? It bears upon its brow the mark of immortality. It is clothed in the brilliancy of the northern lights. Where did she beget these numberless sons of many tongues who are not the fruit of her womb? Canada is born again, richer and more youthful. People of the Orient are turning their hastening steps towards her fertile fields. Let the nations rejoice and be glad that by this modern steel avenue, the best that the genius and engineering skill of the XXth century can devise, immense new dominions have

been thrown open for the husbandry of mankind, the advancement of civilization and the betterment of the world. »

Such will be the consecration of the political task of Canada's foremost citizen, of Canada's most gifted son, of Canada's greatest Prime Minister, Sir Wilfrid Laurier.

THE NATIONAL TRANSCONTINENTAL RAILWAY

The National Transcontinental Railway

Speech delivered in the Senate on May 11th, 1909

THIS is the third time the question of the Grand Trunk Pacific comes before this honorable House, and it is also the third time I have the privilege of replying to the leader of the Opposition who, in 1903 and 1904, when this measure was first brought before this House, was the hon. member for Hastings, Sir MacKenzie Bowell. My remarks on those occasions were

widely published in the press and none of my statements have, as far as I know, yet been contradicted.

I do not say this in a boastful spirit, but merely to inspire some degree of confidence in the remarks I am about to make.

Transcontinental Railway Commission.

But before proceeding with my remarks, I wish to refer to some adverse statements which have been made as to the qualifications of the four members of the Transcontinental Railway Commission who are entrusted with the direction of this great undertaking. The gravest charge against them is that they are not railway men. Yet no one will deny that the Canadian Pacific Railway is a wonderful success and if the hon. gentlemen will examine the names of the distinguished men who incorporated the Canadian Pacific Railway, they will observe that not one of them was a railway man: Lord Strathcona, then Sir Donald Smith, was not a railway man;

Mr. Stephens, now Lord Mount Stephen, was not a railway man; Mr. R. B. Angus was not a railway man. None of the directors I know of were railroad men.

The railroad men, we imported from the United States: Mr. William Van Horne, now Sir William Van Horne, the distinguished Chairman of the Company, and Mr. Shaughnessy, now Sir Thomas Shaughnessy, its able President, came to our country from the United States. We were glad to welcome them and they have accomplished great things for Canada.

Mr. Schreiber's under-estimate.

What brings this question more particularly before this House to-day, is the fact that the Government engineer, Mr. Collingwood Schreiber, a most able man of vast experience, estimated the cost of the prairie section at $17,333 per mile, and the Government agreed to guarantee three quarters of that amount, but this estimate proved to be altogether too low.

Now, before lending any more money for the prosecution of this great enterprise, it is our duty to see what has been done, and to inquire whether the country has ample security for the loan it is about to make.

There is no disguising the fact that the railway is costing much more than was anticipated by some of the engineers who framed the original estimates, but there were other engineers who did not under-estimate the cost.

Actual cost of construction.

Mr. Schreiber was mistaken, but it was not exactly his fault that he made this error; he assumed that it was a prairie road throughout, but I will prove that it is not. The actual cost of construction is $35,000 per mile. The cost of construction above subgrade alone is $12,000 per running mile and it is most important to remember that this is an expenditure common to every mile of the road whether the work be heavy or light.

Cost above sub-grade. It includes fences, rails etc, ties, telegraphs, depots, section houses, turn-tables, engine houses, ballasting, division yards and buildings; the amount is partly made up as follows:

	per mile
Rails	$5,500
Track laying	250
Ties	2,000
Ballast	1,000
Turn-table, terminals and engine houses	1,000
Depots	500
Section houses	250

Deducting this $12,000 from the estimated cost of $17,333, it leaves for the construction of the railway to grade only $5,333 per mile.

The spirit of the contract was that the Government was to guarantee three quarters of the total cost; and the three quarters of $35,000 would be $25,250. The prairie section is 913 miles long and the present loan would be equal to $10,734 per mile which,

added to our $13,000 guarantee, would make a guarantee of $23,734 per mile. We have a first mortgage on the $13,000 guarantee.

I may mention that the prairie work ran up to 12,000 cubic yards per mile, and that in the mountain section it amounted to very much more.

The divisional point between the prairie and the mountain sections was fixed at Wolfe creek, 125 miles west of Edmonton, without any dispute: Mr. Kelliher, the chief engineer of the Grand Trunk Pacific, consenting to the point fixed by Mr. Schreiber, notwithstanding the heavy work done east of Wolfe creek.

Cost of Bridges. The cost of the bridges between Winnipeg and Edmonton will be as follows:

Bridge over the Assiniboine river . .	$ 93,000
Bridge over the Assiniboine river, at St-Lazare	53,000
Bridge over the south Saskatchewan .	351,000
Bridge and trestle over Battle river .	541,200
Approach thereto	45,000
Bridge over the north Saskatchewan .	618,000

Other minor bridges between Winnipeg and Edmonton bring up the cost of steel structures and masonry work to $1,674,800.

West of Edmonton, the Pembina river is crossed by a bridge costing $320,000, making in all $2,000,000 for bridges alone in the prairie section.

Canadian rails throughout. It is most satisfactory to know that from Winnipeg to Wainwright, a distance of 667 miles, the track has been laid and the road is actually in operation without having cost a cent to the tax-payers of this country, neither in land nor in money: the responsibility of the Government being limited to the stipulated guarantee. Another very satisfactory feature is that all the rails for this railway are being made in Canada, either by the Dominion Iron and Steel Company, or at the Algoma Steel Works, thus giving the Canadian people the benefit of that large expenditure.

Cost of Eastern section. I would estimate the cost of the eastern section at $108,000,000. The Ontario Government have built the Temiskaming and Northern Ontario for a distance of 250 miles. A member of this House was on that commission and he will bear me out in the statement I am about to make. The first section of that railway has not as good a gradient as the National Transcontinental Railway, but the last 150 miles which connects with that line at Cochrane Junction has, I understand, the same easy gradient.

The railroad built by the Ontario Government has cost for the 250 miles the sum of $15,000,000. It is a very simple question of proportion; if 250 miles cost $15,000,000, what will 1,804 miles, the distance from Moncton to Winnipeg cost, and the answer is: $108,000,000.

The Temiskaming and Northern Ontario has been built through a country very similar to that which the National Transcontinental

railway traverses. Now, as the construction proceeds, the interest on the money expended is added to the cost of the road. For instance up to the 31st of December last, the expenditure was $46,000,000. The interest on that is being added every year to the principal; but during the first seven years of operation, interest is not paid.

Equipment and rolling stock.

Another matter the hon. gentleman did not put before the House, is the fact that the entire equipment of the road, not only from Winnipeg to the Pacific coast, but from Moncton to the Pacific coast, must be furnished by the Grand Trunk Railway, and out of the twenty million dollars of rolling stock which they are compelled to put on that road, five million dollars of that equipment is bound to be made for and marked National Transcontinental Railway and to remain on that portion of the line between Winnipeg and Moncton.

Guarantee for Mountain section. Allusion has been made to the change in the contract in 1904, relating to the mountain section. Instead of guaranteeing an amount up to $30,000 per mile, as the contract provided when it was estimated that the cost would be $40,000 per mile, the engineers having found that the road would cost more than that, the Government agreed to guarantee 75 per cent of the amount of the actual cost, which was in accordance with the spirit and the very essence of the contract.

In guaranteeing 75 per cent, the Government are not incurring much risk, because they have not only the guarantee of the good old Grand Trunk Railway with its $187,000,000 assets, but in addition, the 25 per cent of money which has to come from some other source than the Government.

Future value of stock of G. T. P. The total stock is $45,000,000 of which $20,000,000 is preferred and $25,000,000 common, and

by the original contract the Grand Trunk Railway was bound to hold the $25,000,000 common stock, but in the amended contract, they were allowed to dispose of some of the common stock.

My hon. friend, the leader of the Opposition, is very anxious about the security for this loan.

I would refer him to Mr. Borden's speech. There he will see that according to Mr. Borden's own opinion, the mere influx of settlers and the growth of the country will cause such a rise in the stock of the Company that in a few years time the shares will be selling at $100 or $150.

I cannot give my hon. friend for Calgary any better authority than his own leader in the House of Commons as to the security the country will hold for this loan.

Progress of work.

Now that we have seen how much has been expended on this work, let us examine what the progress has been.

In New-Brunswick, there have been 40 miles of rail laid; in Quebec, from Quebec city westward, altogether about 120 miles; and from Winnipeg eastward, 149 miles; making a total of 309 miles including the sidings, and the sidings are considerable. For instance on the Winnipeg section, if my memory serves me right, there are some 35 miles of sidings and yards. The grading in New-Brunswick, to the 31st of November last, was 150 miles; the grading east and west of Quebec 254 miles, in the Abittibi district, 20 miles; and from Winnipeg eastward, 245 miles, making a total of 669 miles.

Country's approbation.

Now the most serious charge made by my hon. friends on the other side of the House, and also in another place, is that the Moncton section has been divised for a political purpose. If it were so divised, it worked admirably; for from Levis down to the end of the province of Quebec, all but one county tra-

versed by the Transcontinental Railway have returned supporters of the Government.

In New-Brunswick, the whole district traversed by the Railway has returned liberals, so that if it was a political job, it worked admirably, and the people approved of it.

The longest continuous line in Canada.

The railroad is divided into three main sections : the first from Moncton to Winnipeg, 1,804 miles ; secondly, the prairie section from Winnipeg to a point 125 miles west of Edmonton, at Wolfe Creek, a distance of 915 miles, and lastly the mountain section 837 miles, making a grand total of 3,556 miles.

No railway of such length has ever been constructed in Canada at one time, and I know of only one other in all the world, the Trans-Siberian railway. But the Trans-Siberian railway cannot be compared or mentioned in the same breadth with this railway which has

been built according to an immensely higher standard.

Advantages of new route. The hon. leader of the Opposition was talking about distances. I find that the distance between Moncton and Quebec is 460 miles, and Mr. Butler claims that if the Intercolonial were to follow that route instead of the present one, the same amount of traffic could be handled and the cost of operation reduced by a couple of millions. Be that as it may, it is to be hoped that his opinion is better than the opinions we have had from others. Every one knows that with the easy gradients on the new route between Levis and Moncton, a locomotive will be able to haul twice the load it can haul on a heavier gradient.

Water-power at Grand Falls. There are two pusher gradients near Grand Falls, but immediately at Grand Falls, it seems as if Providence had designedly placed

there a waterfall of 131 feet head, capable of developing one hundred thousand horse-power, a force quite sufficient to furnish the necessary electrical energy to overcome those gradients.

Now this route, which my hon. friend, the leader of the Opposition, does not view with favour, has a very great and unquestionable advantage over any known route.

Liverpool to Yokohama by new route.

The distance from Liverpool to Yokohama via Quebec and Prince Rupert is the shortest possible one between those points. According to the pamphet published by the Grand Trunk Pacific Company, it is 10,030 miles.

I do not know how that figure is arrived at, for I make it only 9,528 miles, which is 528 miles less than by the Canadian Pacific Railway and 1,313 miles less than via New-York. It would also be 130 miles less than via Moscou and the Trans-Siberian line to Yokohama.

The length of the circle going around the

globe at that latitude is only 19,164 miles, which is, as you know, about 5,000 miles less than by making the grand circle at the equator.

This distance of 19,164 miles is, strangely enough, divided equally between land and water, being 9,500 miles by steamship and 9,500 miles by rail.

Circling the globe in 30 days. Now, with a steamship travelling at the rate of 20 knots an hour — and no one will deny that steamers to-day go much faster than that — the ocean part of the journey would be covered in seventeen days; and travelling at the rate of 30 miles an hour by rail, the 9,500 miles of land would be covered in thirteen days. Of course, the average rate of railway travel is much faster than 30 miles an hour in America, but the trains on the Trans-Siberian Railway go much slower, and therefore 30 miles would be a fair average all around.

Hence, a letter mailed at Quebec and tra-

velling by that route would go around the world in 30 days as will be seen by the following figures:

From Liverpool to Quebec the distance is 2,632 miles and a steamship travelling at the rate of 20 knots an hour would cover that distance in five days.

The distance from Quebec to Prince Rupert is 3.096 miles. A train travelling at the rate of 40 miles an hour — and that speed should not be considered excessive, since the Canadian Pacific Railway, which is not built on as good a standard as the Grand Trunk Pacific, ran the Trans-Canada train last year and the year before at the average speed of 40 miles an hour from Montreal to Vancouver — would reach Prince Rupert in three and a half days.

From Prince Rupert to Yokohama, the distonce is 3,800 miles and a steamship travelling at 20 knots per hour would cover that distance in eight days. Vladivostock is two days from Yokohama, and from Vladivostock to Liverpool would take about ten days, as the rate of

travelling on the Trans-Siberian Railway is slow.

It would therefore take 28½ days to go around the world by this new route, which make Jules Verne's 80 days, once looked upon as chimerical, now appear very slow.

Western Terminus, Prince Rupert. Let us now look at the road and see what sort of a railway we are building; but first let me describe the Western terminus, Prince Rupert.

The foundation is being laid of a model city which in a few years will equal Vancou. ver or Victoria. Prince Rupert has the immense advantage of possessing a very mild climate. Frost is almost unknown there except for a few days in mid-winter. The site has been selected with the greatest care and has been laid out by the most skilful landscape architects of this continent, and the city has been designed with an eye to beauty as well as commerce. The plans can be seen all over

this country and property there will sell at an enormous price because people have faith in Prince Rupert.

Ships from the seven seas will soon ride at anchor in that magnificent harbour, unloading silks and rice, the products of the Orient, and returning will full cargoes of wheat and lumber.

The harbour, at its narrowest part, is 2,000 feet wide and it has a depth, at low tide, of 36 feet. There is no better harbour on the Pacific coast, or perhaps in the world.

There are along the coast other fine harbours, such at Port Simpson, and all have a good depth of water.

Timber and Fisheries. The timber industry in the Prince Rupert's district will assume vast proportions, and the fisheries will give employment to a large number of people. Cannery after cannery will be erected as in Vancouver, and the Grand Trunk Pacific will, as the Canadian Pacific Railway

has been doing for years, carry large consignments of the best of fish to the eastern cities of Canada..

Twenty-five years ago, or even fifteen years ago Victoria, Vancouver, Tacoma, Seattle, Portland, San Francisco and the smaller places like Bellingham, Everett, Aberdeen, Astoria, San Pedro and San Diego were small points in the map. Fifteen years hence, Prince Rupert will without doubt, be the equal of Vancouver.

The finest road in the world. We claim that this new railway will be the finest in the world. That is a common expression to use but in this case it is absolutely true.

I have closely studied this matter, and I have consulted railway experts, and all are unanimous in saying that there is no such railway on the face of the earth as the Grand Trunk Pacific will be when completed.

Route through Rockies. Leaving Prince Rupert, the road follows a very easy gradient along the north shore of the

river Skeena to Hazelton, a distance of about 180 miles. The navigation on the Skeena river is scarcely obstructed as far as Hazelton, proving there is but little difference in level.

From the Skeena river, the railway follows the Buckley river for about 100 miles, and ascending slowly reaches a low summit which corresponds to the summit of the Selkirks; but while the Canadian Pacific crosses the Rockies at an altitude of over 4,000 feet, here the summit is very much lower, for the mountains decrease in altitude as they run north.

The line then runs north of Fraser lake to the Stewart river and then follows another river with an unpronounceable name to Fort George where it crosses the Fraser river.

I may point out that it is intended to construct a branch down the Fraser river from fort George to Westminster, a distance of about 350 miles.

From Prince Rupert to Quebec, a distance of 3,096 miles, there is only one place where

Maximum gradient

the gradient amounts to one per cent, and that is near the summit, from mile 27 westward from the Great Divide up to mile 48 along the Fraser river.

Every one knows that in former years a one per cent gradient was considered an easy one, for it only means 52 feet per mile; so that in these 21 miles there is a drop of about 1,000 feet.

It is important to note that this gradient of one per cent for these 21 miles is not an adverse one for it slopes towards the Pacific. We know that as the grain of Alberta and of the Northern Saskatchewan is moving westward, this gradient will be a favourable one to help it on its way to the coast.

The road then crosses the Great Divide, and I may say in passing, that on the western slope, near Lake Fraser and between fort George and Hazelton, there is some excellent land.

Importance of easy gradients. The importance of easy gradients for the economical operation of a railway is to-day thoroughly recognised, and it has fortunately been an easy matter to obtain these easy gradients on this route owing to the comparatively low altitude of the Yellow Head pass, which is some 3,708 feet, and to the fact that there are no deep depressions to be crossed. The lowest point on the line between Prince Rupert and the St. Maurice river is Winnipeg, which is about 800 feet above the level of the sea.

All the other portions of the road lie on a plateau, without any deep depressions. Now compare this with the Southern Pacific which, in the state of Arizona runs for a long distance, at 263 feet below the level of the sea and thus not only must that railway cross a summit of about 8,000 feet, butit must also descend to 263 feet below the level of tide water, while the highest point on the Grand Trunk Pacific, as I have stated, is in the Yellow Head pass, and is only 3,708 feet above the level of the sea. The

hon. leader of the Opposition lives in Calgary, and the altitude of that city is 3,428 feet, only 280 feet below the highest point on the Grand Trunk Pacific.

A locomotive can easily haul 2,200 tons on a gradient of four-tenths of 1 per cent, but here is another point which has been recently discovered by engineers, from actual experiment and not by theoretical calculations:

A locomotive once started on a gradient of four-tenths of 1 per cent or 21 feet to the mile at a certain speed, will maintain that speed all the way up the gradient. On the other hand, should a truck break loose, it will descend such a gradient by gravity, but without accelerating its speed. This is an immense advantage, for with a gradient of one per cent or 52 feet per mile, if a car gets free, it travels down the gradient at a speed which rapidly accelerates until an accident happens.

There is a certain gradient between 1 per cent and one tenth of one per cent which a car

will descend without accelerating its speed, for although such a gradient is sufficient to keep the car moving by the force of gravity, the resistance of the air prevents any acceleration of the speed.

This is an ideal gradient, for with such a gradient, there is no difficulty in hauling a train load of 2,200 tons which, with a deduction of ⅓ for the weight of the train, leaves a net load of 1,446 tons, or in other words of about 50,000 bushels of wheat, taking wheat at 33 bushels to the ton.

The following table speaks for itself and shows the immense superiority of the Transcontinental Railway over any other transcontinental route, and we therefore may claim that it will be the finest railway in the world.

Let me simply say that my most fervent prayer is that Sir Wilfrid Laurier may be permitted by Divine Providence to see the last spike driven in this great National highway and the nation can than say: "Laurier has finished his work!"

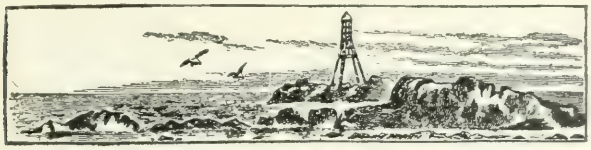
Name of Railway	Highest Summits.	Maximum gradient in feet per mile		Total ascent in feet overcome	
		East-bound.	West-bound.	East-bound.	West bound.
	1 summit.				
Grand Trunk Pacific—					
West. Div. Winnipeg to Pr. Rupert.....	3,712	31	26	6,990	6,890*
Eastern Div. Winnipeg to Moncton	.....	.....	31	.....	.....
	2 summits				
Canadian Pacific	5,299	237	116	23,106	23,051
	4,308	.....	.....	.....	.....
	3 summits				
Great Northern	5,202	.....	.....	.....	.....
	4,146	116	116	15,987	15,305
	3,375	.....	.....	.....	.....
	3 summits				
Northern Pacific	5,569	.....	.....	.....	.....
	5,532	116	116	17,830	17,137
	2,849	.....	.....	.....	.....

	3 summits				
Union Pacific System Omaha to San Francisco	8,247	.....	.....	.....	.....
	7,017	116	105	18,575	17,552
	5,631	.....	.....	.....	.....
	5 summits				
Omaha to Portland	8,247	.....	.....	.....	.....
	6,953	.....	.....	.....	.....
	3,537	106	116	18,171	17,171
	3,936	.....	.....	.....	.....
	4,204	.....	.....	.....	.....
	2 summits				
Western Pacific, ($150,000 per mile).....	5,712	53	53	9,385	5,076
	5,018	.....	.....	.....	.....
	6 summits				
Santa Fe System.....	7,510	.....	.....	.....	.....
	7,453	.....	.....	.....	.....
	6,987	.....	.....	.....	.....
	7,132	175	185	34,003	34,506
	2,575	.....	.....	.....	.....
	3,819	.....	.....	.....	.....

* From elevation at Moncton.

N.-B. — Southern Pacific railway in Arizona runs for several miles at a level 263 feet below sea level.

THE HUDSON BAY ROUTE



THE HUDSON BAY ROUTE

Speech delivered in the Senate on the 19th February 1907

I WISH to thank the hon. member for Marshfield, for bringing up this question, of the Hudson Bay Route which should interest every member of the Senate and which he appears to have studied with his customary industry.

If most of us were to follow his example, there would be no doubt in the public mind as to the usefulness of the Senate. But having paid the hon. gentleman this compliment, I

regret I cannot arrive at his conclusion and I propose to show to the House the suggested railway to Hudson Bay would be a very unprofitable venture.

Climatic conditions not governed solely by latitude.

He takes what I consider to be a very false basis, when he speaks of latitude as governing the climatic conditions of a country. He tells us that Hudson Bay has the same latitude as Scotland and Churchill, the same as Devonshire, and would have us beleive that the climate of those places is somewhat similar, which is altogether misleading.

The isothermal lines are the proper criterion by which to ascertain the climate of a country.

Quebec, for instance, has the same latitude as Nice, and Mentone, yet no one who has lived in Quebec, and visited the Riviera would dream of comparing the climate of those places, which differs enormously.

To give some idea of the coldness of the

Isothermal lines, the real criterion of climate.

climate of Hudson Bay, I would point out that the isothermal line which passes through the most southern part of Hudson Bay passes also through Great Bear lake and thence north of Fort Macpherson and on to the mouth of the Mackenzie river, in the Arctic Ocean.

This same line on the east side of Hudson Bay passes through the most northern part of Greenland.

Intensity of cold in Hudson Bay region.

There is no place on earth, in the same latitude, colder than Hudson Bay, with the exception perhaps of a few places in Siberia. The mere inspection of the terrestrial globe showing the isothermal lines will prove what I say. The intensity of the cold in Hudson Bay is so great that we feel its effects even here in the city of Ottawa, and it causes the isothermal line to make such a wide deflection that this same line passes through

Gaspé and the Straits of Belle-Isle, and strikes the most northern part of Norway, the land of the midnight sun.

Paucity of timber renders lumbering unprofitable.

There is a strip of country extending for a distance of 200 miles inland and following almost the shape of the bay, within which there is nothing but rocks and muskegs, and so few trees that it would not pay a lumberman to cut that timber.

A little lumbering is done along the rivers, where logs can be cut and easily hauled to water, but when that narrow fringe of timber is exhausted, it will not pay to lumber there. Moreover, to carry on lumbering operations in this region it would be necessary to import all supplies, and to build eight hundred miles of railway to transport both men and supplies, which would obviously render lumbering very expensive.

Voyage of the "Neptune." Most of us have read the report of the voyage of the *Neptune*, which has been widely quoted by my hon. friend for Marshfield, and also by my hon. friend for Halifax. If you read that report carefully, you will find that the *Neptune* met ice every month in the year, and that there were icebergs in the straits until the middle of August.

Dangers arising from icebergs. To those who see icebergs from the deck of a steamer, they may appear very beautiful, but they are in reality exceedingly dangerous to navigation, for the visible part of the iceberg is only one-eleventh of its bulk. An iceberg 70 or 80 feet high, draws 700 or 800 feet of water, and an iceberg drawing so much water is very often carried south by the strong southerly current, while the surface ice may be driven by the wind in an opposite direction.

The field ice may travel two or three miles an hour, and when an iceberg going in an op-

posite direction meets it, it crashes through it like a great battleship. Now, if a steamer not specially constructed to meet such conditions, were caught in that ice, it would be crushed like an egg shell. There are no merchant steamers that could possibly live between an iceberg and field ice travelling in opposite directions, and so, ships navigating those waters must be specially constructed as was the *Neptune.*

Description of the "Neptune." The *Neptune* was first sheeted with 4-inch British oak, then with four inches of greenhart, and the space between the outside lining and planking was filled up with solid rock salt in order to preserve it and make it perfectly safe against any shock from the exterior.

Such ships are made saucershape, so that when the ice presses them they are lifted bodily out of the water. The bow of the *Neptune* is of solid timber, eight feet thick and sheeted with one inch of iron. The timbers

inside are all laid cross-ways, and there is so much bracing, that little space is left for cargo. My hon. friend knows perfectly well how those steamers are built. All who have seen the sealing ships leaving Newfounland know how they are constructed.

Such ships can only take a small cargo and are almost useless as freight carriers — with the necessary supplies on board, including an extra year's provision, for it is doubtful when entering Hudson Bay when it will be possible to leave it — the ship's space is pretty well filled.

We all remember what a quantity of supplies the *Arctic* carried. I saw her lying in dock at Quebec, and there was no space to move about either on the deck or in the hold. I am glad to say, "en passant", that nothing was wasted, and that what was not used was brought back.

If the House will permit a slight digression, I would observe that Hudson Bay is pretty well

D'Iberville's expeditions to Hudson Bay, 1687-1697.

known to Quebecers. In history, we read that our ancestors thought nothing of snowshoeing from Montreal or Quebec to Hudson Bay, and it may be of interest to know that Pierre Lemoine — an ancestor of the gentleman who was for a long time clerk of this Senate, and an ancestor also of our Sergeant-at-arms — left Montreal in 1685 with his brother and a few valiant followers on an expedition to Hudson Bay.

They started on snowshoes and carried their ammunition and supplies with them. I do not suppose they carried tents, so they slept in the open, covered with the blankets they carried with them. They arrived at Hudson Bay on the 20th June. We would consider that a great exploit to day. I wonder how many of our brave volunteers of the present age would undertake such a trip with any prospect of ever returning.

I refer to this matter, because Mr. Low, in his report, has given an historical summary of the expeditions to Hudson Bay, and as this is a public document, bearing the stamp of the Government of Canada, the facts contained in it ought to be accurate. Mr. Low speaks of a large force accompanying Iberville, but the fact is that it was a very small party indeed.

They arrived at Hudson Bay on the 20th of June, and easily captured the forts along the Bay. Then Iberville and his brother Maricourt, with nine men in two bark canoes, captured a warship which lay in the Bay. They returned to Quebec two years later, in 1687, in this very ship laden with furs worth a king's ransom.

In 1688, Iberville went back to Hudson Bay, and believing that peace had been concluded between France and England, he sent back his ship again laden with furs, and kept with him fourteen men. Later, towards the fall,

he found three warships in the Bay so caught in the ice that the men could not come on shore and were obliged to remain imprisoned in their ships.

In the spring of the year, the ice bridge still existing between the shore and the warships, their crews were powerless, and were suffering from scurvy. Iberville, with his fourteen men, seized the three ships, the largest of which carried twenty-four guns. He was not able to man the captured vessels and so was obliged to sink two of them, keeping the largest, in which he returned to Quebec in 1689. Eight years later, in 1697, Iberville sailed from Newfoundland with several ships.

These ships were caught between an iceberg on one side and drift ice on the other. One of the ships was lost in collision with the *Pelican*, and another was so suddenly crushed by the ice that her crew had barely time to save themselves. That occurred in the Hudson straits, on the 28th of August in the year 1697.

Voyage of the "Pelican." The *Pelican* entered Hudson Bay and on the 4th September arrived at Fort Nelson. There Iberville saw three ships which he ascertained were the English men-of-war *Hampshire*, 52 guns; *Deering*, 32 guns; *Hudson Bay*, 32 guns. Iberville, hero that he was, offered battle, and made for the largest, prepared to board her.

But the captain of the *Hampshire* changed his course so as to avoid the encounter, and poured out a broadside which swept the decks of the *Pelican*. The battle lasted three hours and a half. The *Hampshire*, in delivering her broadside, presented her flank to the *Pelican* and the latter so concentrated and directed her fire on the water line of her enemy as to tear a gaping hole in her side.

The *Hampshire*, in full sail, sank in her own length, and all on board perished. Then the *Hudson Bay* surrendered when she saw the *Hampshire* sink, and the *Deering* sought safety in flight. Such a terrible snowstorm

blew that night that, at midnight, notwithstanding all the ability of Iberville as a navigator, both the *Pelican* and the *Hudson Bay* were driven ashore.

The next day, the 5th of September, the storm had ceased, and while they were caring for the dead and wounded, twenty of the men were frozen to death. That occurred in 1697, opposite Fort Nelson, in Hudson Bay, and in view of such an inhospitable climate, even in September, I doubt if my hon. friend will declare that much navigation can be carried on with commercial success in those waters.

I apologize for having recalled these facts, but as Mr. Low has related another story, I thought it my duty to make the truth known. Iberville wrote to the King of France that he was tired of taking Hudson Bay. He asked for another mission, and Louis XIV sent him to conquer the West Indies. Later on, Iberville founded Louisiana, which for years remained an appanage of the French Crown.

Voyage of the "Adventure."

The *Adventure* was sent to Hudson Bay by the present Government, and she was specially built and equipped. She made just the one trip, and had to return with one-third of her cargo, not being able to land the balance. Had there been good wharves and modern equipment at the different posts, doubtless she could have landed all her cargo. But the fact remains, that the *Adventure* sent by this Government could not land all her supplies, and had to come back in the month of October for fear of being caught in the ice.

I might mention here that for the last 200 years the Hudson Bay Co's ships have reached Hudson Bay about the 1st September; but of course steamships would make better time.

Proposed railway from Regina to Churchill impracticable.

As to the question of transportation, I may say that for the last few years I have given special attention to this matter, and I think I can de-

monstrate that the idea of my hon. friend for Marshfield is impracticable from a commercial point of view.

He says that a railway from Regina to Fort Churchill, 800 miles, connecting with a line of steamers to Liverpool, is better than a dozen transcontinental railways. Let us see if that is not somewhat far-fetched.

Absence of local traffic.

In the first place, this proposed railway would have very little local traffic, especially for the 200 miles contiguous to the shores of Hudson Bay, and the through traffic would be confined to a period of three or four months during which the navigation of the Bay in open.

Marine insurance rates to Hudson Bay prohibitive.

Secondly, steamers plying to Hudson Bay would have to charge enormous rates, for they could not be insured except at a very high figure.

Why are our freight rates much higher than

from New-York, or other United States ports? It is because the marine underwriters will not give the same rates of insurance to ships going to Montreal and Quebec as they will to those going to Portland, Boston or New-York. The insurance rates govern the freight rates.

I ask the hon. gentleman for Marshfield to tell us whether an ordinarily constructed ship could be insured to navigate those straits for three or four months? Or, if it could be insured — because I understand in London you can insure almost anything if you pay the premium —whether the freight rates would not be so high that there would be no advantage in that route.

Light railway to Hudson Bay practicable.

I do not think a high class railway like the Trancontinental should be built to Hudson Bay. But there is no objection to the construction of a pioneer railway, and I believe we will see, in the near future, one or two such railroads going to Hudson Bay,

not for the purpose of carrying wheat to England, but more for the purpose of exporting fresh fish and minerals that may be found in that country. I do not wish to say that I am entirely against the construction of a railway to Hudson Bay, but I would be very chary about taking a stock in such a railway.

Two statements of hon. member for Marshfield corrected.

I think I have made it quite clear to the House that the cost of sending the wheat of the West to Liverpool via Hudson Bay would be prohibitive, and that that route is impracticable. Now, let us examine what it will cost to send it by the Transcontinental. But, before doing so, let me correct two statements made by my hon. friend for Marshfield.

He said that I had declared, some three or four years ago, when speaking on the Transcontinental Railway, that the distance from Winnipeg to Quebec, was 1350 miles, and that

I was now quite willing to admit that I had made a mistake.

I was not correct, but I think my hon. friend will pardon me when I tell him the extent of my mistake. The line has now been located, chained, and surveyed, from the abutment of the Quebec bridge to the city of Winnipeg, and as any one can verify by simply inquiring from the Transcontinental Railway Commission, the distance is 1,349½ miles. I am quite willing to admit I made a mistake.

The actual chainage is 1,349½ miles, and so I was out half a mile. I hope the hon. gentleman will forgive me. I ask pardon for that error.

Mr. Charlton's prophecy.

My hon. friend has also said that Mr. Charlton did not dare repeat, in the book in which he published his speeches, the statement he made in the House of Commons, that wheat could be carried from Winnipeg to Quebec for six cents per bushel. My hon. friend said that Mr. Charl-

ton was too modest to repeat that statement in his published book, and that he had withdrawn it.

Now, knowing Mr. Charlton, as hon. members of this House know him, they will not readily believe this. Mr. Charlton has been a pioneer in advocating in the parliament of Canada the possibilities and potentialities of railways in this country, and when he made that illuminating speech in the Commons four years ago, when he spoke of building a railway through this north country with a gradient of not more than four-tenths of one per cent to the mile, people thought it was the speech of a visionary.

They thought no such railway could be constructed. But if the hon. gentlemen will come down to the Railway Board, where the plans are deposited, they will find that not only between Winnipeg and Quebec, but that between Edmonton and the summit of the Rocky Mountains, in the Yellow Head Pass, the profile and plans show a grade of 4-10 of

1 per cent and that Mr. Charlton's dream is within sight of accomplishment.

The Transcontinental as a wheat carrier.

I now come to the all-important question of the cost of transporting the western wheat to tidal water by this new Transcontinental route. What is the cost of transporting 2,000 tons for one mile, west of Winnipeg, at the present day? I have the figures here. The cost per train mile is $1.35 made up as follows:—

Maintenance of way and structures...	$0.35
" " Equipment..... ...	.30
Transportation, including coal, oil, wages of personnel, &c, &c.....	.60
Taxes, etc	.05
General expenses.....	.05
Total.....	$1.35

Cost of carrying wheat: Winnipeg to Quebec.

Now by multiplying this figure $1.35 by the number of miles from Winnipeg to Quebec, namely 1350 miles, the

cost of hauling 2000 tons from Winnipeg to Quebec is arrived at. It amounts to $1,822.50 I want to make my figures perfectly clear to the hon. gentlemen. 2000 tons is the total weight behind the locomotive, but as the cars may be taken to weigh about 800 tons — a liberal allowance — the net load carried by the train is about 1200 tons, which is equivalent to 40,000 bushels of wheat, taking wheat at 33⅓ bushels to the ton.

The cost therefore of hauling 40,000 bushels of wheat from Winnipeg to Quebec would be $1822.50 or 4½ cents a bushel, and if 30% profit be allowed for the railway company, the sum of 6 cents per bushel is arrived at, proving that M. Charlton was absolutely correct in the statement he made four years ago.

Comparison between G. T. P. and C. P. R.

Let us see how the Transcontinental will compare with other railways in Canada, and I may say, at once, that

no railway in this country or elsewhere has ever been built according to such a high standard of excellence, as the Transcontinental.

Take the C. P. R. for instance; it is a fine road, but it is not a modern road and has gradients of 1½ per cent east of the Rockies and even of 4 per cent or 200 feet to the mile in the Rockies.

A railway handicapped with such heavy gradients will never be able to compete with the Transcontinental, even if it were to charge rates twice as high as the latter.

There is no railway in Canada, at the present day, which can carry wheat at such low rates as the Transcontinental. This ought to prove to the farmers of the West that they have in the Transcontinental the best, the safest and cheapest way of getting their grain to tidal waters.

Figures which challenge contradiction.

I have given the figures and the hon. gentleman will have plenty of opportunity of getting railway experts to contradict

them if they can. I shall be very glad if they can show me where I have erred in any respect. I challenge contradiction. I have given a great deal of study to the question, and I believe my figures to be correct.

When I stated, four or five years ago, that easy gradients could be obtained on the immense plateau to the north, members on the other side would not believe it. When I stated that the railway would be 1,350 miles long, the hon. gentleman did not credit it.

When I stated it would be 1,400 miles, the hon. gentleman for Westmoreland rose from his seat to express his incredulity and he told me that the Liberals in the other House had declared that the distance would be 1,475 miles. I said I had nothing to do with what they said, that I had measured these distances carefully, and I was confident in the accuracy of my statements.

The hon. gentleman replied the Minister himself had said so and I added the Minister had not consulted me; that if he had consulted

me, perhaps he would have been better informed.

Absence in Railway facilities in Quebec.

I regret to see that the hon. gentleman for Wolseley is not in his place. He complained that the farmers of Manitoba and the Northwest were not being well treated, in that they had no railway facilities.

I do not see how the hon. gentleman can make such an assertion in the presence of senators from the province of Quebec.

In the Temiscamingue district, we have the towns of Ville Marie, Guiges and Duhamel twenty-five years old and their only means of communication is by bark canoe in summer and dog sled in winter; and yet the hon. gentleman complains that the people of the Northwest are not well treated.

The people of Quebec contribute their money to build the railways of the Northwest; they cheerfully pay and do not complain that they are not well treated.

Take, for instance the case of the railway to Nominingue.

As president of the colonization society of Montreal, I, together with some parish priests, called on Sir Thomas Shaughnessy, and we begged for the construction of 33 miles of road from Nominingue. The parish priest pointed out that 75 families had left the place owing to the absence of a railway and two whole parishes had threatened to abandon the district unless the railway was built within a reasonable time. And in his generosity Sir Thomas said that in two years he would build thirty three miles. Yet the hon. gentleman for Wolseley would have us believe that the North West was badly treated.

Whole counties without railways.

In the county of Charlevoix, which has been settled for a great many years, there is not a single railway to be found.

Take the county of Gaspé, represented by the Postmaster General, hon. Rodolphe Le-

mieux, and you will not find one mile of railway in that immense county which has a coast line of 300 miles. Still, we do not complain, and cheerfully do we contribute to build railways elsewhere.

Let no one rise in the House and say, in presence of the representatives of the people of Quebec, who have contributed to build railways in the Northwest, that they have been badly treated. The farmers are well treated in the Northwest, and will be still better treated.

There are parishes, which have been in existence for 200 years in Quebec, where there are no railways. Where would you find a county like Charlevoix with a population of 25,000 and no railways?

I admire the representatives of the Northwest for demanding railway facilities for their people. I commend them for it, and I only wish the people of Quebec would take a leaf out of their book and ask for railways for our province. The Canadian Pacific Railway

proposed, last year, to build 967½ miles of railway, some in Ontario and some west of Lake Superior, but how many miles did they propose to build in Quebec? Not one.

The Canadian Northern Company are building hundreds of miles of road in the Northwest. How many miles are they building in Quebec? None.

Sir Wilfrid Laurier went down to St. Jacques L'Achigan in the county of Montcalm to open a railway six miles long. Why, were I Prime Minister of Canada, I would be ashamed to inaugurate such an insignificant line.

I hope that the farmers of the Northwest will realize the good that the liberal government has done to the country, and will properly appreciate the greater railway and postal facilities which they now enjoy, and the lesser taxation they are called upon to bear.

I trust they will acknowledge the wise statesmanship which has provided them with the National Transcontinental Railway to carry

their produce to the sea-board at cheap rates, rates so low that the ten cent Roblin rate cannot compare with them. I trust the province of Manitoba will expand her territory towards the Hudson bay, until she equals in area her giant sisters, Saskatchewan and Alberta, so recently elevated to statehood by a Liberal, prime minister and a Liberal Government.

And lastly, I am confident that the people of the West will not fail to manifest their gratitude to Sir Wilfrid Laurier, who so prudently, wisely and successfully guides the fortunes of our young and vigorous nation.

THE GEORGIAN BAY CANAL

THE GEORGIAN BAY CANAL

Speech delivered in the Senate on February 6th, 1908

I HAVE been asked to call the attention of the Senate to the importance of the early construction of the Georgian Bay canal.

I accept cheerfully the task of addressing the House on this most important project, for I know of no body better qualified to appreciate the merits of such a great undertaking.

It seems to me that it is to questions of this nature the Senate should devote some of its

valuable time, and I am sure that the hon. gentlemen will give all the attention which the magnitude of the enterprise deserves.

Fitness of Senate for dealing with national questions.

We are, it seems to me, in a better position in this House than in the House of Commons to study the great questions which interest the whole of Canada. In the other House, members through local influence, may be obliged to attend more to local wants; but in this House, we are free to attend to measures which interest the country as a whole.

The hon. gentlemen who compose the Senate, have nearly all had long training in public affairs, and are well qualified to deal with such national questions.

It is an incentive moreover to most of us to study these larger problems, for we know that our tenure of office in this House lasts as long as our natural life, and gives us an opportunity to see some of the measures and reforms we

advocate carried out before we disappear from the political arena.

Of the Commons the same cannot be said. Some able man who might have been capable of rendering great service to his country may see his polical career nipped in the bud, because the particular constituency which he represents may not like the party with which he is affiliated, or may prefer a party who has the good fortune to have for leader a man who enjoys the esteem and confidence of almost the entire electorate of the country.

A very good and able man may thus be driven out of public life, and fall almost into oblivion not through any fault of his own, but simply because the party to which he is opposed has at its head an abler man than the party to which he belongs. I believe that this House, because of its independent position, is most capable of judging of the best mode of carrying out this vast project.

We are not tied either to the St. Lawrence or the Ottawa routes. We are perfectly free

to look at both sides of the question, and if this House should conclude, after mature study, that the enormous amount which would be required to construct the proposed canal should be spent in improving the St. Lawrence water-way, then it is for the Senate to express approval or disapproval of either one or the other.

I wish to lay before the House some of the facts I have collected after considerable research during the last two months. There has been so much said about this question which has been before the public of Canada for more than fifty years, that it is very difficult to state anything new on the subject.

Project considered under four heads. This question may be divided into four great sections: there are so many considerations involved in it. Firstly, there is the engineering feasibility; secondly, the commercial potentialities of the enterprise; thirdly, the

water powers and their utilization ; and fourthly, the transportation problem.

Allow me first to refer to the engineering problem, because I have had more occasion to study that particular branch of the subject.

Selection of route. — Champlain's exploration.

The most important point, to commence with, is the selection of the route. On this the 300th anniversary of the founding of old Quebec, when we are commemorating the foundation of that city, could anything be more appropriate than to recall at the very outset that the first man who explored the Ottawa route and made it known to civilization, was the distinguished traveller who founded the city of Quebec — Samuel de Champlain.

Three hundred years ago, in 1613, this bold and brave man, accompanied by four Frenchmen and one Indian, travelled from Quebec to Montreal, and thence penetrated up the Ottawa river as far as the county now known as

Renfrew. There he had to winter, not being able to proceed further.

The lost astrolabe. I may relate a small incident which happened at that time. The only astronomical instrument he had was an astrolabe, which was used for measuring the angle of elevation of the sun, and thereby finding the approximate latitude.

This instrument was lost, and strange to relate, it was found by an Ontario land surveyor, in June, 1867. It is now, I understand, deposited in the Department of Crown Lands at Toronto.

Champlain's second exploration. In 1615, Champlain resumed his exploration, determined this time to push as far as he could westward, for, as we all know, in those days the problem was to find a way across this continent to the China sea.

On his second trip, he was accompanied by ten Indians, one interpreter, and one servant. It was a very small party to penetrate through the wilderness at that time, and with which to contend against hostile tribes; but nevertheless, his voyage, as we know, was successful. He ascended the Ottawa as far as the Mattawa river, and seeing that the Ottawa turned north and that the Mattawa lay more directly in his course, he followed it.

After ascending the Mattawa river, he entered Lake Talon and from Lake Talon into Turtle Lake; and thence from Turtle Lake into Trout Lake. There he crossed the watershed dividing the waters which flow eastward to the St. Lawrence from the waters that flow west, towards Georgian Bay.

The difference of level between the waters flowing east and those flowing west, is only four feet; thus necessitating a very small portage to enable a canoe to continue on its voyage westward.

Having reached that altitude, Champlain

crossed Lake Nipissing, made a careful survey of some parts of it, descended the French river and entered Georgian Bay. There he saw for the first time the Huron Indians who inhabited the shores of Georgian bay, and who were in a far more advanced state of civilization than the other tribes inhabiting the North American continent.

The hon. gentlemen will see that before any European had ever heard the roar of Niagara Falls, the Ottawa and French river route and waterway was already known.

The LaVerendrye's voyage. These early explorers were certainly wonderful men. Last year, in this House, I spoke of those spirited adventurers who travelled from Montreal to Hudson Bay on snowshoes and I gave an account of their thrilling voyage.

The LaVerendrye brothers not only followed the route that Champlain explored in 1613, but crossed Lake Huron and ascended the rapids of Sault Ste. Marie, crossed Lake Supe-

rior, continued up Rainy river and Lake of the Woods, and finally pushed their way across the Rocky Mountains.

The two brothers were unaccompanied, and as far as can be ascertained, crossed the Rocky Mountains, by the same pass as the Canadian Pacific railway; descending on the western slope of the Rockies, they took possession of all that immense territory in the name of the King of France.

Laverendryes' Map.

The LaVerendryes drew a map of their journeys, and some years ago, I saw that map and was struck by the wonderful accuracy with which they have shown the various routes across this continent.

The places were they indicated that posts should be established are the very places where posts were established, either by the Company of the Hundred Associates, or by the Hudson Bay Company, or the Northwest Company,

and these posts are now towns and prosperous cities.

The Ottawa river route. Champlain returned to Quebec in the year 1615, after having explored many other parts of the country, including Nova Scotia, Cape Breton and Prince Edward Island.

For 240 years, the Ottawa river route was the scene of a picturesque procession of zealous missionnaries, intrepid trappers and hardy employees of the Hudson Bay Company engaged in the fur trade, and the shores of that river echoed with the songs of the French Canadian trappers and voyageurs. Fully half the supplies for the Great West were forwarded by that route.

The three great watersheds. The voyageurs were great explorers; their knowledge of the country and of its various routes was certainly greater than ours in spite of all our facilities for travelling.

They early discovered that there were three principal routes on this northern continent, which followed three great watersheds east of the Rockies Mountain.

The first watershed extending eastward from the foot of the mountains to a point about 100 miles east of Winnipeg, and reaching to the south as far as the Missouri plateau; this great plateau is drained by the numerous rivers which flow from it into the Hudson Bay.

I may mention, *en passant*, that I was articled to a gentleman who came to this country by way of Hudson Bay, landing at York Factory. He travelled to the settled parts of Canada by following these waterways.

The second watershed and one of equal importance, which was travelled over and over again in the early days, is the great table-land extending from the Missouri plateau along the Mississipi down to the gulf of Mexico.

The third watershed comprises all that vast extent of territory draining into the great

lakes: Superior, Huron, Michigan, Erie and Ontario, that immense plateau drained by the St. Lawrence, and with which we are most familiar.

These three great plateaus are well defined, and indeed, it seems indispensable that there should be three such great terraces to prevent the water from flowing too swiftly from the centre of the continent to the Ocean.

Were it not for Niagara and other great falls which break the continuity of the slope, the whole interior of the country would be a vast desert; but the Divine Architect of the universe, in His infinite wisdom, has provided these great dams to prevent this continent from becoming an arid waste.

First survey of Ottawa route, 1856

It was in 1856 that the first actual surveys were made on the Ottawa River route.

The first survey made by the then Department of Public Works was under the supervision of Mr. Walter Shanley, a distinguished

engineer, who passed over to his reward not many years ago, and who, for many years, was member for the county of Grenville.

Mr. Shanley then thought, as most people did in those days, that a channel with a draft of ten feet was amply sufficient for all the future trade.

Mr. Shanley's estimate.

His estimate of the cost for a ten foot channel was some $24,000,000. Later on, he was asked to estimate for an 8 feet draft, which reduced the cost by eight millions, leaving sixteen millions as the total estimated cost of the canal.

It may be interesting to members for Montreal to know that in 1863, the Montreal Board of Trade caused a report to be prepared on the Ottawa and French river navigation problem; which shows that, even in those days, the Board of Trade took an interest in this great enterprise.

Mr. Shanley's report, as well as the later one of Mr. Clarke, were unfavourable in one

respect: Between Georgian Bay and the Summit, the difference of level is 99 feet, and naturally, from this Summit, all the water necessary for the operation of the canal must be obtained from the very highest point.

Mr. Shanley reported that, in his opinion, the water shed falling from Trout lake and Talon lake was not sufficient to supply a canal of ten feet or of eight feet, and that even by uniting these lakes, enough water could not be got.

Mr. Clarke's scheme, In 1858, Mr. T. M. Clarke, another engineer, also employed by the Government of United Canada, made a report, very much on the same lines as that of Mr. Shanley, and a large book of some three or four hundred pages, as large as our Debates, was then published on the subject.

I have had this book in my possession for the last few weeks. Mr. Clarke, like Mr. Walter Shanley, stated that the supply at the

summit was insufficient, but Mr. Clarke proposed to raise the level of Lake Nipissing by some 15 feet, and lower the level of the three lakes in order to make one long water stretch.

That scheme would have been the best, had it been practicable; but the expense however was prohibitive on account of the enormous cost of the rock cutting at the summit which would have been necessary to obtain the required level, and now that the town of North Bay has been built on the shore of Lake Nipissing, and the town of North Bay and the Canadian Pacific Railway are at such low level — I think some fourteen feet, if my memory serves me right, above the level of the lake — it would be almost impossible to raise the level of the lake without flooding the town of North Bay, and the Canadian Pacific Railway works.

That project consequently must be abandoned. But I may be able later on to show that even this obstacle has been overcome by the able engineers whom the Government has em-

ployed for the last few years in making a study of the surveys and plans of this great scheme.

It may be of interest to this House to know that for the last three or four years up to now some $600,000 has been expended by the Government in surveys, plans and explorations. This shows that this project has become a practical issue, and, I may be pardoned if I go into it, somewhat at length.

The surveys made fifty years ago were brought to a sudden stop.

Recommendation of first committee.

Ten years ago, a committee of this honorable House was appointed, consisting of eighteen members, eleven of whom are still active members of this House. They, after going into this question very thoroughly, and hearing evidence of surveyors, and reviewing the engineering aspect, the commercial aspect, even the military aspect of the question, strongly recommended to the Government the

advisability of proceeding with the construction of this work. That was ten years ago.

Resumption of surveys. No further move was made for six years; but four years ago, surveys were again started, and now it has been proposed to construct a canal with twenty-two feet of water to accommodate vessels drawing nineteen and twenty feet, leaving enough water under the keel of the vessel for steerage way.

Now the question arises whether it is expedient for us to undertake this gigantic work, the cost of which is estimated at about a hundred million dollars.

Cost of twenty feet canal. Is it wise to construct a canal twenty-two feet deep, or would it be better to make it fourteen feet, the same draft as the canals on the St. Lawrence, at an expenditure of about thirty millions? Hon. gentlemen may be amazed at the extraordinary difference in cost between

a canal twenty-two feet deep and one fourteen deep, and that eight feet more in depth should make the huge difference of $70,000,000; but it must be remembered that in increasing the depth, the quantities are increased in a cubical ratio.

It is not the length or breadth merely that are increased but the cube of the contents, and so the quantities are multiplied three times over, thus accounting for this immense difference.

Some hon. gentlemen may say that if the one hundred millions were spent on the St. Lawrence route, perhaps it could be deepened to twenty-two feet draft. I was at first inclined to believe that fourteen feet would be sufficient, but fourteen-foot canals do not seem to be able to compete with modern railways, as the smaller boats do not carry freight at cheaper rates than railways and cannot therefore materially divert traffic from the railway lines. It appears from all that has

been written lately on the subject, that the only canal that will successfully attract the traffic is one of twenty-two feet depth and that it would therefore be better for Canada not to incur such a large expenditure to build a canal of only 14 ft. dept.

Shallow canals a failure. Canals of that depth have proved a failure in diverting traffic from United States ports. They have not succeded in bringing freight to Montreal, and it may be astonishing to the hon. gentlemen to hear that no fleet of vessels of fourteen feet draft has ever been built.

When the St. Lawrence canals were to be deepened to fourteen feet, that depth was considered the maximum draft of vessels on the great lakes; but before our canals were opened the tonnage of those vessels had increased over and over again and to-day there are on the great lakes vessels 600 feet in length, with 60 feet beam and drawing from twenty to twenty-one feet of water.

Cost of deepening the St. Lawrence canals.

Moreover, if it were possible or feasible to deepen the St. Lawrence canals, it would cost, according to the best information I can get, but for which I am not to be considered responsible, two hundred million dollars.

The length of the St. Lawrence canals being so much longer than those on the Ottawa route, accounts for the greater cost. A barge canal, as you know, is much more economical. Two barges to be used as consorts, and a small barge run by steam is a very cheap way of carrying freight; but it necessitates transhipment at the entrance of the canal. That is why ships coming to Port Colborne have to discharge their cargo.

Absolute necessity of 20 feet depth.

All vessels of fourteen feet draft have disappeared from the lakes. The ore trade, the grain trade, and all the other heavy cargoes are carried in vessels with a draft of twenty feet and

consequently there would be no use in having a canal of only fourteen feet.

Other hon. members of this House may entertain a different opinion, and, if there is to be a discussion on this question, I hope they may be able to prove that a fourteen-foot canal will be just as good as one of twenty-two feet, for if that can be established, it will save the country an expenditure of seventy million dollars.

Our neighbors are a very wide awake people and are seriously contemplating the construction of a canal from Lake Michigan by way of the Mississippi river to the Gulf of Mexico, a fact which should spur us on to immediate action.

The level of Lake Huron and Lake Michigan is 580 feet above the sea, and the fall from Chicago by way of the Mississippi to the Gulf of Mexico is also 580 feet.

Why 20 feet depth necessary. Ship canals save transhipment of cargo and this is equivalent to a saving of a thousand

miles distance, because a ship can travel a thousand miles at less expense than it can tranship its cargo from a vessel drawing twenty feet to one drawing fourteen feet, for thus the time and cost involved in breaking bulk are saved.

What is wanted is a uniform draft throughout the route equal to that of Sault Ste. Marie canal. Immense ships are able to carry a ton of cargo twenty miles for one cent, or one-twentieth of a cent per ton per mile and no small boat and no railway, can compete with that. The Canadian fourteen-foot canals have proved that such competition is impossible.

Mr. George Y. Wesner, a member of the American Society of Civil Engineers, says that no great commercial importance can be attached to any route unless the largest vessels can utilize it.

Small canals unable to compete with railways.

The experience of the Erie which at one time was the only water route

between the great lakes and sea level, and which gave such an impetus to that great and wonderful city of New-York, is very instructive.

In the early days, the Erie canal carried a large proportion of the freight from Buffalo to New-York; but with the improvement of railways the canal gradually lost the traffic until, from carrying almost the whole of the freight, it was reduced, last year, to carrying only about one tenth of it. The decrease of the business on the Erie canal led railway men to believe that railways could compete successfully with waterways.

That is a question that has been discussed over and over again; but without entering into a controversy, there is no doubt that small canals with small barges cannot compete advantageously with railways; while large vessels on large waterways have no difficulty whatever in securing the traffic.

Other advantages of 22 feet depth. The people of the United States have now come to realize that it would be to their advantage to ship their products by Canadian routes to tidalwater at Montreal or Quebec. Mr. Gardner S. Williams, of Cornell University, strongly advocates a twenty-two-foot draft for the Georgian Bay canal to Montreal. He says that starting from either Chicago, Duluth or Fort William the distance to Montreal by the Ottawa route would be only one day more than via Buffalo.

Another immense advantage of the twenty-two-foot draft is that the great fleet of vessels drawing twenty feet which are locked up idle in the lakes during the winter season, would be enabled to get to tidal water, and though they could not cross the Atlantic with safety, they could be employed in the coasting trade along the Atlantic coast during the winter months.

Coming back to the Ottawa route, I may

Small cost of improving French river

say that the entrance to French river will require very little improvement to make it a very satisfactory harbour indeed.

Some slight excavation will be required, but when the river has been properly buoyed and lighted, and furnished with the necessary facilities for unloading and reloading, ships drawing twenty feet of water will be able to ascend with perfect safety to the first lock.

The construction of the French river section of the canals is the very crux of the question. Here it is not a case of making a canal but of improving the river.

Route of proposed Canal.

There are three great lakes, as it were, divided by three falls, and these lakes are connected together by narrow gorges from 200 to 400 feet in width, across which dams could be built and the water impounded. There would be three ascents, one starting from Georgian Bay, which would have a lift of 22 feet. Then as-

cending the river for some twenty miles or so, the next defile is reached and there another dam would be constructed. The third dam would bring vessels to the level of Lake Nipissing. The total ascent from Georgian Bay to Lake Nipissing is sixty eight feet. Then Lake Nipissing is crossed, a distance of 18 miles, to a point one mile and one half east of North Bay.

Alternative proposals for works on North Bay.

At North Bay, there are no facilities for unloading ships of deep draft, but by raising the level some six feet, deep water would be found near the shore. At North Bay, two alternatives have been suggested, namely: one to build a large pier into the lake and to construct an elevator upon it for the transhipment of the freight from North Bay to Montreal.

The other proposal is to excavate a part of the canal and revet one side of it with cribwork to form a long continuous quay upon

which the necessary railway facilities would be provided.

I may say that these works at North Bay would cost about a million and a half; but all that work would be useful when the canal is continued further on.

Supply of water at summit. From Lake Nipissing there is a rise of 28 feet to the summit; and at the summit lies the most difficult part of the project, and one which baffled former engineers. But now, however, the problem seems to have been solved by the engineers employed on the present survey.

They propose to allow the water on that watershed to flow through Trout Lake, Turtle Lake and Lake Talon. — They have also discovered, south of these lakes, another watershed with an area of 305 miles; and by diverting only one river and making it flow into these lakes, then connecting the lakes together, a water shed of over 600 miles area would be

secured which, it is claimed, is amply sufficient to supply all the water necessary for operating the canal.

Thus, the great problem of providing sufficient water at the summit has apparently been solved in spite of the adverse reports of such eminent engineers as Mr. Shanley and Mr. Clark.

Artificial supply of water. Another system has been advocated. Supposing this watershed had not been found, it was proposed to supply water by means of electrical pumps. Remember, there is only a lift of eighteen feet, and with electrical pumps operated by the water powers in the vicinity, a sufficient quantity of water could be pumped to supply any deficiency, and we are further informed that hydro-electric power for the purpose would not be expensive.

This system I do not recommend, as I think it would be, perhaps, a little too much to ask any one to go on the hustings to advocate

pumping water into a twenty-two-foot canal to make it navigable.

Summit to Montreal Harbour. Now we come to the descent to Montreal, a total fall of 646 feet from the summit to Montreal harbour. The Mattawa river is very like French river in forming deep ravines with wide expanses intervening and the construction of a few locks would suffice to greatly facilitate navigation. There is a drop of 177 feet in the Mattawa river, before it enters the Ottawa. The distance from the junction of the Mattawa to the capital is 195 miles and the fall is 360 feet while from Ottawa to Montreal the fall is 122 feet. It is certainly astonishing to learn that in the 440 miles, from the mouth of French river to the foot of Montreal island, less than 30 miles of canal would be required. The rest would be open navigation and in that open navigation their would be only fifty-seven miles of improved channel where dredging might be required. Apart

from that eighty-seven miles of canal andimproved channel, the rest is absolutely open navigation, so that vessels could traverse it at the same speed as on the great lakes or on the ocean.

New problem.

Now, here is a point which I understand is absolutely new, although the hon. gentlemen will be ready to assert that there can be nothing new in this question which has been before the people for forty years.

However, after half a century, there is this new consideration: we are all aware of the great fluctuation in the water levels of the Ottawa river, nay, of all our rivers in Canada, owing to the rapid melting of the snow in the spring. We call it the spring freshet.

The St. Lawrence is not affected to the same extent as other rivers, its volume at high water is scarcely more than double its volume at low water; this means that the flow at low water is not quite doubled in the spring. But

the Ottawa river, in flood time, is fourteen times greater than at low water, and consequently, another problem faces the engineers, for if that immense mass of water were allowed to rush down the river, the current would be so strong as to render navigation impossible during May and June. Moreover, the whole of the works would be flooded, locks and all with a rise of twenty feet or so. Therefore, it would be absolutely necessary to have some control over the waters and it has been proposed to store the waters in the upper lakes.

A point of law.

Here I think a nice point of law arises for the consideration of the hon. gentlemen of this House who are learned in constitutional law.

At the head waters of the Ottawa river there are the great lakes Victoria and other lakes, and it is proposed to erect dams at the outlets of these lakes in order to store the water, and it is also proposed to impound the water of Lake Temiscamingue.

Now, how far can this Government encroach on provincial territory for such a purpose, and how far would a province allow them to interfere with their territory?

It is fortunate that there are no settlements where these lakes are situated, consequently no compensation would be necessary in that respect; but there is a doubt whether the federal Government can impound water in Ontario or Quebec without the sanction of the provincial authorities. This question I leave to the lawyers of this House who will be able, no doubt, to elucidate it.

The impounding of the waters of all the large tributaries of the Ottawa would also be necessary and we all know that the province has the disposal of the water-powers.

Disposal of water powers.

Now, the immense water-power which will be developed in that drop of 790 feet between Georgian Bay and Montreal, amounting altogether to a million horse-power, will have to

be disposed of. Will the provinces allow the central Government to dispose of this large amount of power which will be of great value?

We know about the case of the Lachine canal, and we heard the other day in Montreal, about the federal Government farming out the water-power of the Beauharnois canal. There is no doubt as to the federal power over these canals; but whether the new canal could be disposed of by the province, is something that I leave to be discussed by other members of this House.

Storage of water.

I may say that the storage of water is carried on to-day in many countries, Russia, Germany, France and even in the province of Quebec. Some are inclined to think that Quebec is somewhat retrogade, and yet in the Lake St. John district, the provincial Government is impounding water for the use of the water-powers at Chicoutimi, a distance of 100 to 150 miles above the mouth of the river.

Our neighbours in the United States have no less than forty-one reservoirs for the purpose of impounding the surplus waters of the Mississipi. Most of these are situated in Minnesota and Wisconsin, and they so regulate the flow of the Mississipi river, that the gauge at St. Paul, which during dry weather in former years was at zero, is now kept at a height of three feet, thus improving immensely the navigation of the river and preventing floods, which at one time threatened the country all along the Mississipi. By means of these dams, sixteen billion cubic feet of water are retained and immense destruction of life and property prevented.

Description of locks

Returning to the Georgian Bay route; the high banks on both sides of the Ottawa afford a ready means of raising the level of the various water stretches. The excavation for the locks will be made nearly all in solid rock, and this means a great saving in cost, it being only ne-

cessary to cement the sides of these locks to make them smooth.

We are all aware that the immense expenditure involved in constructing locks is due to the cost of masonry. The stones must be very accurately dressed to fit closely together and rendered absolutely water tight. Every stone in a canal lock must be cut so true that no water will leak through between the courses. Therefore there is an immense advantage in having nearly all the twenty-seven locks needed on this route hewn out of the solid rock, so that the work to be performed will consist principally in the construction of the gates at both ends. These locks will be of very great length.

It is proposed to make them 650 feet long, in order to accommodate the ships I have spoken of which have a length of 600 feet.

Ottawa to Montreal

At Ottawa, the canal would pass on the north side of Hull, increasing considerably the water-

powers used by the industrial establishments there.

From Ottawa to Montreal, there would be considerable flooding, because the banks are low. There will be no less than 15,000 acres of land flooded, but it will be cheaper to expropriate that area of land than to excavate, because rock excavation under water is very expensive, almost as expensive as rock excavation in a tunnel, costing from $3 to $3.50 a yard.

Therefore it is desirable, as far as possible, to avoid excavation and to build up the sides in order to secure the necessary depth of water.

At Montreal it is proposed that there should be two routes, one passing in front of the city, and the other via the Back river.

Approach to Montreal

The present Grenville canal would be absolutely of no use. The route in front of the city of Montreal starts near the Victoria bridge, at

what is called the Mackay pier, along the guard pier, and by the embankment.

The water would be brought to the same level as the water at St. Ann's. The embankment would proceed in the stream as far as Nun's island, and thence continuing on the outside of the shore, would cut the Lachine canal somewhere near the centre, and then follow the shore up to St. Ann's.

There another lock would be necessary, making three locks on the route in front of the city of Montreal.

The Back River route

The other route which would be by the Rivière des Prairies, or what we call the Back river, which is a branch of the Ottawa, would, in my opinion, be a much preferable route. It is proposed to bring it to the level of the lake of Two Mountains, and maintain that level to a point about a thousand yards east of where St. Denis street strikes the shore of the Back river.

Here there would be a fall of thirty-five feet equivalent to an effective water-power of 60,000 H. P. at that point. It was also proposed to have another lock at Bout de l'Ile, which would be the end of this Ottawa waterway and where there would be a lift of twenty-four feet, giving also a water-power of some 40,000 horse-power.

100,000 horse-power developed near Montreal.

This would mean 100 000 horse-power available within almost a mile of the city of Montreal. This 100,000 horse-power could be sold and people would gladly pay $10. a year per horse-power, running for twenty-four hours a day, which would give no less a revenue than $1,000,000 yearly from the power generated at these two dams.

These figures may appear exaggerated ; they may seem like the calculations of a dreamer, but what is the fact? The president of the Shawinigan Falls Power Company is an hon. member of this House. — I am sorry he is not

in his seat just now; but he will vouch for the fact that at present from Shawinigan Falls 16,000 horse-power are brought to Montreal a distance of 87 miles, and the price paid, and cheerfully paid by the Montreal Light, Heat and Power Company is $15 per horse-power, or $240,000 a year to that one company.

The Shawinigan Power Company also sell power to such an extent, that their annual statament of revenue last year was very nearly $650,000 and for the current year it will be over $700,000.

The construction of the Ottawa and Georgian Bay Canal would develop 100,000 horse-power within one mile of the present limits of the city of Montreal, and even if the Georgian Bay canal were never built, I would strongly advocate the development of these powers.

It would be a revelation to people living in Montreal to know that a dam across the Back river, (near the church and the convent of the Sacred Heart), would develop 60,000 horse-power which is about one-fourth or 25 per

cent of the horse-power required for all the lighting, heating and street car traction power in the metropolis of Canada.

This dam would not cause much flooding because the level of the Lake of Two Mountains is not very much higher than the banks of the river and besides jetties would be built on each side to prevent the water spreading, and in such a way as not to interfere with the drainage of the farms.

Increased shipping facilities. Even if no canal were built, it would still be a great advantage to have those two magnificent sheets of water. The water back of the Island of Montreal would be dammed at Bout de l'Ile where there would be a lift of twenty-four feet. The intention is to make it thirty feet on the mitre sill of the entrance of that lock, in order that ocean vessels might come up to the second dam and so that for all that distance of twelve miles the depth would be thirty feet. Therefore, this would form a

very valuable addition to Montreal's harbour, and would afford increased facilities for shipping and docking. The other basin would be above the dam and there would be an intervening stretch of water of 3½ miles.

A great boon for the working classes.

The working classes could leave Montreal and and in twenty or twenty fives minutes reach the shores of these two magnificient sheets of water for a five-cent fare ; and there breathe fresh air and admire the beautiful scenery of the adjoining country, which would have been converted into a large park, and an ideal summer resort. Montreal would then become one of the finest residential cities of this continent. Even if the Georgian Bay canal project should be abandoned, if it were possible to build this dam it would be a great boon to the Island of Montreal generally and particularly to the working classes of that city. Why, Montreal would have a million population in a short time!

Commercial aspect of project.

Now, as to the commercial potentialities of this project; every owner of a steamer is a corporation in himself and can regulate his own freight rates. It is not like a railway company. A railway company may be a system of one, two or three roads and they may pool their interests, but the experience is that vessel-owners will not and do not pool their interests. Therefore, every vessel-owner has a personal interest in regulating rates, and thus both producers and ship owners reap the benefit.

Grain carried to tidal water without breaking bulk.

Freight can be carried at lower rates by a ship canal, than by a barge canal, as was proved in the case of the Erie canal, which was not built so as to compete advantageously with the railways from Buffalo to New-York.

By no other route than the Ottawa waterway can the products from the great lake ports be taken to tidal water without breaking bulk.

The *Omaha Grain Exchange* says in its last report that if grain could be carried from lake ports to the sea-board without breaking bulk, it would be worth ten million dollars to Nebraska farmers.

I do not know to what extent this is true, but if it is worth that much to the farmers of one state of the American union, how much more will it be worth to that inexhaustible wheat producing country that we have in the Canadian Northwest? Would it not prove a very profitable investment indeed? All we have to do is to divide the wheat area of the Northwest by the wheat area of Nebraska to see how many tens of millions would be coming to us if the statement made by the *Omaha Exchange* is correct.

Then again, by this Ottawa waterway, the meat products of Chicago (the very centre of the United States) could be shipped in refrigerators, and taken to any port in the world.

Large tonnage of lake steamers. The trade of the great lakes is greater than the combined coasting trade of England, France and Germany. The annual coasting trade of these three countries does not aggregate 70,000,000 tons, while the annual trade of the great lakes was 75,000,000 tons. To give some idea of the immense tonnage of the vessels which ply on the great lakes, recently the steamer *E. H. Garrick*, passed through the Sault Ste. Marie canal with 12,386 net tons of cargo. These big ships are called *big lakers* a new and a very appropriate name, and the average cost of their maintenance per day of 24 hours is about $400. Now, from Fort William — and when I say Fort William I might say from Duluth, or from Chicago, because there is very little difference in the mileage— from Fort William to Montreal, it would take one of those big lakers some ten days for the round trip, and allowing five days for detention we have a total of fifteen days at $400 a day or $6,000 for the whole trip.

Freight rates by big lakers. Now what would the earnings be? Assuming for comparison such a ship to carry 10,000 tons at $1 a ton, which is a very high rate, the net profit for each trip would be $4,000, even were the ship to return empty.

Now, if any cargo were carried on the return journey, the profit would of course be much greater. Assuming, for instance, the steamer to return with one third of a full cargo, that is about 3,300 tons, this would represent a sum of about $10,000 at the rate of $3. a ton, which is the usual charge for that distance. The total profit therefore on the whole trip would be $14,000. These figures indicate the possibilities and the potentialities of these great ships.

Rates by ships of Welland canal type. On the other hand, with ships of the Welland canal type, 250 feet in length, 42 feet wide and 14 feet draft, the cost of maintenance including the items already mentioned, is $125.00 a day. Now, such ships would

take 20 days to do the trip by the unimproved St. Lawrence route, including 7 days detention and the cost of the trip therefore would amount to $2,500,00.

Now, what would her earnings be assuming her carrying capacity to be 2.000 tons? The answer is very simple: it would be $2,000., for there is no reason why these ships should get a higher rate than the big lakers. Consequently, each trip would involve a loss of $500.

Therefore, it is absolutely necessary that these 14-foot-draft vessels should not return empty.

With one third of a cargo full for the return journey, or about 700 tons, the earnings would be increased by $2,100, assuming the freight is carried at the same rate as on the big steamers, which would give a surplus on the round trip of some $1600.

Rates from Lake ports to New-York.

Assuming that Fort William, Duluth and Chicago are about equally distant from Buffalo, and that the same ports, are also equi-distant from Montreal, and that a vessel from any one of these large ports will carry grain at a cent and a half a bushel to Buffalo; and that a large laker will carry wheat to Montreal from any one of these three ports for two cents a bushel, which is 25 per cent more); the rate to Montreal will be 2 cents and 1½ cents to Buffalo. But from Buffalo to New-York, the rate is 4 cents a bushel; which will make five cents and a half from Duluth to New-York by the Erie canal to which must be added the transferring charges at Buffalo and New-York, which at a very low estimate, will cost one and a half cents.

Consequently from these upper lake port to New-York the rate is seven cents before grain reaches the ocean steamers.

Rates via Montreal and via New-York.

If the same grain were carried via Montreal, the rate would be two cents to Montreal, and four and one half a cent for the ocean voyage from Montreal to Liverpool, making 6½ cents. Consequently, by the Georgian Bay and Ottawa route wheat would be landed in Liverpool at a rate half a cent cheaper than it can be landed in New-York.

I must say in all fairness that from New-York the rates to Liverpool are cheaper than from Montreal, the New-York ocean rate being 2½ cents as against about 4 cents from Montreal; but there is still a difference in favour of Montreal, because adding 2½ cents to the 7 cents, the rate to Liverpool becomes 9½ cents via New-York, whilst by the Georgian Bay ship canal route it is only 6½ cents, or 50 per cent cheaper that by the United States route.

Liverpool determines price of wheat.

The Liverpool market, as the hon. gentlemen know, governs absolutely

the price of wheat. It does not matter whether the wheat crop has been grown in India, in the Argentine Republic, in Russia or in the United States, or in the Dominion of Canada; the price is fixed in Liverpool, and every bushel of wheat on the face of the earth represents the Liverpool price minus the cost of transportation.

The position of our people would thus be that in Fort William, we would have the Liverpool price, less 6½ cents, for every bushel of wheat our three great railways will bring there.

You know what immense grain emporiums Port Arthur and Fort William will be. You know the Canadian Pacific Railway are doubling their track between Port Arthur and Winnipeg, that the Canadian Northern have huge elevators there, and that the Grand Trunk Railway are building a mighty grain chute from the Transcontinental line at Superior Junction, for a distance of 240 miles, on low grades, aiming for Fort William.

All that immense wheat supply which will be stored there, could be carried across the ocean to Liverpool at the small charge of 6½ cents per bushel.

Revenue derived from white coal. The last remarks that I have to make are in regard to the water-power that will be generated by the construction of the canal—the white coal of Canada in which this country abounds. We shall never be under the necessity of using as much coal as they do in the United States, or in European countries, for our natural water-powers will generate immense energy to operate our industries and public works.

It is safe to assume that the Ottawa, the Mattawa and the French river could easily furnish one million horse-power.

Now supposing one dam — and there are to be 27 of them—would develop 60,000 horse-power, and bring a revenue of $600,000, as would be the case at Back river, the total horse-power would be over 1,000,000 which could be

sold at the low rate of $10. per horse-power and thereby bringing in a revenue of $10,000,000.

What is the cost of one horse-power generated by coal? It requires 7 tons of coal to generate one horse-power per year. Now, assuming coal to cost $3 per ton, the cost ofa horse-power becomes $21 a year. And if we add to this the cost of handling the coal which may be put at $10 a ton, the total cost per horse-power becomes $31.00.

Electrification of railways. The Railway companies would very soon avail themselves of such cheap power to electrify their systems instead of paying $31.00 per H. P. as at present.

Would an enterprising company like the Canadian Pacific Railway, with its able president, hesitate very long if the Government said to them: « Prepare for the electrification of your road, we will supply you with power at one-third of what you are now paying », the electrification of railways would no longer be

a dream of the future. We all know that within a radius of fifteen miles from New-York, every train is driven into that city by electrical energy.

In the first place, electricity would be utilized for lighting the river for the 440 miles, making a beautiful avenue as bright by night as by day, rendering navigation just as easy at night as by sunshine, and illuminating the harbour of Montreal.

The numerous industries at North Bay, Ottawa and Montreal would gladly avail themselves of this cheap power.

Smelting by electrical process.

I am told — but of this I have no personal knowledge—that there are immense deposits of iron ore along the route. If that be the case, we have the white coal with which to smelt that ore.

It can be smelted, as it is smelted in France successfully to-day, by electrical process, and I think the hon. Speaker can tell us it has been done also at Sault Ste. Marie. I do not

know whether it has been successfully used there or not, or whether it has been fully tried, but I know the Government is having ore smelted by electricity at Sault Ste. Marie.

It is said that a French metallurgist who has been looking into the possibilities of the Ottawa valley as a manufacturing centre, has declared that we would see there within ten years the largest electric ore smelting industry in the world. I forget the name of the gentleman at the moment, but he is a very eminent scientist who is engaged in this electrical smelting in France.

In that country, power has to be gathered from here and there, perhaps 100 horse-power here, and perhaps a thousand horse-power there; but in the Ottawa valley the supply would be unlimited.

Use of electrical energy in various industry.

Then there are other industries for instance the manufacture of aluminum which the hon. gentleman for Rothesay has

been advocating, and there is also the manufacture of carbide of calcium for acetylene gas.

Within the last few years, the United States have attained supremacy in the manufacture of iron. To-day, the United States of America manufacture more iron and steel than the whole of Great Britain.

For a long time, Britain led the way in that field of industry. Let Canada now help the mother country to recover her supremacy.

Now, I wish to deal briefly with the transportation question. The greatness of a nation depends on its agriculture, its mines, its forests and its industries.

The lower the cost at which these products and raw materials can be transported to the markets of the world, the greater is the profit of the producer, and the purchasing power of the consumer.

It is unnecessary to renew the long controversy on the subject of the relative advantages

Maximum carrying capacity of railways.

of rail and water routes. It suffices to say that it would seem as if the railways of to-day had reached their maximum carrying capacity for the size of their locomotives and freight cars can scarcely be much increased. The locomotives are more than twice, even three times as heavy as they were twenty or fifteen years ago, and are now as large as they can advantageously be made, for they cannot be increased in width, because they would not pass through tunnels or bridges, and the increase can only be in height.

Enormous locomotives top heavy.

The locomotives have been raised, higher and higher above the rail, and those monsters which you see pulling forty or fifty cars are now so high that the centre of gravity is twice as high as it was when locomotives were originally designed to rest upon a basis of four feet eight and one-half inches; consequently the top-heaviness has increased two fold.

Very heavy cars when laden with material which is more bulky than heavy, and high locomotives make trains so top heavy that the outer rail being elevated, the train, if brought to a stand still on a curve is liable to topple over. In this country we have no permaneut ways constructed especially for freight trains and others for passenger trains.

In the United States, the Pennsylvania and the New York Central have four tracks. The two inside tracks are for freight trains only, and there the elevation of the outer rail on curves is not so high, because the speed of the freight trains is not so great; but on the passenger tracks the outer rails are very much more elevated on curves so as to resist the centrifugal force in rounding the curve at high speed.

Railways unable to cope with traffic. No less an authority than Mr. J. J. Hill — and he was the pioneer of large locomotives and cars, low grades and easy curves — admits

that the business of the country is increasing to such an extent that railways cannot pretend to cope with the necessities of trade, and that none of the railways can do it. That is the reason why he advocates the making of a canal from Chicago to New Orleans, a project which has also met with the approval of President Roosevelt. Railways have increased one per cent per year, while the business of the country during the last ten or eleven years has increased about ten per cent. There is no possibility of the railways keeping up with the ever increasing demands on them, so it becomes absolutely necessary to make greater use of the water courses and natural highways with which Providence has endowed this continent.

Quebec to New Orleans via French river.

The original route from Quebec to New Orleans via French river and the Mississipi, which was used two hundred years ago by my ancestors, is the same I am now

advocating. So it will not be the first time that the Ottawa and the French river route has been linked with the Mississipi.

Our neighbors are a wide awake people and are alive to the importance of this project. Notwithstanding some protest from our government, they have constructed the Chicago canal under the pretext of disposing of the sewerage of Chicago with its two millions of inhabitants. But this canal is something more than a sewerage canal, for sewerage canals are not usually 200 feet wide and 20 ft. deep. Its length is forty miles, and at the southwest end, there is a fall of forty feet developing to-day 40,000 horse-power. That power is sold by the promoters of the canal to the industrial establishments in the vicinity, and it brings in a fair return on the cost of the canal. Congress voted $31,000,000 for the canal. It was cut through solid rock, but the depth of the cut was not very great. The Chicago canal empties into the Des Plaines

river, which, in its turn, empties into a tributary of the Mississippi.

Thus it will be seen that the idea of making a canal to connect the great lakes with the Mississippi has already been put in practice by the enlightened people of Illinois.

The Ottawa water-way, the great lakes, the Chicago canal and the Mississippi, form an inland water route such as does not exist in any other part of the world.

Champlain's dream

If Champlain, whose dream it was to find a route to the China Seas, were to come back to-day, he would rejoice to see that at the dawn of the twentieth century a project is within reasonable distance of accomplishment by which the products of the Orient will be carried through the Panama canal, thence up the improved Mississippi and the Chicago canal to the great lakes, across Lake Huron, up the French river, through Lake Nippissing, down

the Mattawa, Ottawa and St. Lawrence rivers to the old citadel city of Quebec, the tercentenary of whose foundation I trust all patriotic Canadians will join in celebrating this year.

THE GEORGIAN BAY CANAL

THE GEORGIAN BAY CANAL

Speech delivered in the Senate on May 12th, 1908

IN bringing this important debate to a close, I desire, in the first place, to offer my sincere thanks to the honorable gentlemen who have taken part in the discussion, and especially to those who have referred in such kind terms to the professional study I have made of this great enterprise; also to the senators who have lent us such an attentive ear.

I said, in introducing this question, that I knew of no body of men in Canada so well

qualified to discuss intelligently and dispassionately such a great project as this, and I think I am justified in saying that the debate which has taken place has fully borne out my statement and has also clearly shown to the thinking public what a deep interest we senators are taking in this great undertaking.

It has been said, on various occasions, that the Press does not take enough interest in our proceedings.

But since this question has been discussed, the Press throughout Canada, and even across the water have reported very fully our debates.

La Presse, for instance, with its 100,000 circulation, the largest by far, of any paper in Canada, published a verbatim translation of the speech I had the honour of making in this House. This evidently shows that when we take up a live question in the Senate we are sure to find a responsive echo in the Press of this country.

To-day, I wish first to reply to the remarks of the hon. member for Russell with regard to

the depth of the canal, and then I should like to explain to the House the immense revenue and advantage the country would derive from the utilization of the enormous water powers of the Ottawa river, which would be developed by the construction of the proposed canal.

Depth of Canal.

The hon. gentleman for Russell appears to think that we should have a barge canal, of 14 feet navigation, like the St-Lawrence canal. But we already have one 14 foot canal, the fleet for which has never been built. It is not deep enough to enable all the vessels which ply on our great lakes, to make use of it; and, I do not see that their would be much advantage in having two 14 feet canals, one on the St. Lawrence and one on the Ottawa.

If a 14 feet canal is large enough, the wisest course for the country is to keep its money for other public works, and make use of the present 14 ft. canal which will answer the purpose

if we are to remain satisfied with trans-shipping goods at Port Colborne and so on.

Paramount necessity of 22 feet depth.

But if there is to be a canal from Montreal to Georgian Bay via the Ottawa River, there is no question that it must be a 22 ft. canal, which means 20 feet of navigation. Such a canal would enable all vessels plying on Lake Superior, Georgian Bay and Lake Michigan, all vessels that pass Sault Ste. Marie, to use the Ottawa route to reach the Ocean port of Montreal, and this would obviously be an immense advantage.

A 22 ft. canal, moreover is deep enough for all the ocean going cargo boats in the world.

Not many cargo boats exceed 20 ft. in draft. Cargo boats commonly called tramp boats, have to call at various ports; for instance, the cargo boats which ply to the Argentine Republic load at Rosario, well up the river Plate, but they complete their cargo at La Plata, outside of the bar.

On the Danube also, we find vessels loading at Ibraila and Galatz, and completing their cargo at Salina outside of the bar.

Now these two great rivers, the Danube and the river Plate, are the competitors of the St. Lawrence, and they have at their mouths, bars where there is only nineteen to twenty-one feet of water, according to the season and weather, less therefore than the suggested 22 feet for the proposed canal.

It must be borne in mind that these cargo boats have to call at various ports throughout the world, and therefore the twenty two feet draft will be quite sufficient for all general trading.

As the hon. gentleman for Montarville has just said, if this canal were constructed, Montreal would then become both an ocean port and a lake port.

The water powers of the Ottawa.

Now to pass on to the question of the water po-

wers of the Ottawa, to which the hon. member for Russell has referred.

It is now well understood that by impounding the waters at the twenty seven locks of the proposed canal, in the manner the hon. gentleman has described, a force of at the least 1,000,000 H. P. would be developed and would be available the whole year round. What does this mean? It means that such power would be equivalent to an annual supply of 7,000,000 tons of coal, drawn from an inexhaustible mine.

Now if you look at the production of coal in the most progressive countries in the world, you will see that in 1906 the production in Great Britain was six tons per head of the population, in the United States, Germany and Belgium four tons, in France and Austria-Hungary one ton and in Canada one ton and a half.

In Canada we have many water-powers already in use, and a great many yet undeveloped; and as we require far more power

than we can produce, with an expenditure of a ton and one half of coal per head of the population, it is clear that there will be a demand for all those undeveloped water-powers just as soon as they become available.

If we could harness the water-powers of the Ottawa river as I have described, they would furnish as much power annually as could be generated by 7,000,000 tons of coal and we could thus give employment to a couple of millions more of people, who would be just as busy and productive as the people of the United States, Great Britain, Germany and Belgium.

Even with this additional power, Canada would only have the equivalent of an annual consumption of two and one half tons of coal per capita, and would still be a ton and one-half per head behind the United States, Germany and Belgium, in the use of coal. There can therefore, be no doubt that the whole of the power generated by the construction of the proposed canal would be fully utilized.

Superiority of water over coal, as a motive power.

There is another distinct advantage of water-power over coal, and that is its cheapness, for it is a well established fact that power can be generated much more economically by water than by coal, and consequently many industries which would be unprofitable if operated with coal at $3.00 a ton, would become profitable with the cheap power generated by water.

If this 1,000,000 horse-power be equivalent to 7,000,000 tons of coal, and coal be put at the low price of $1.50 a ton, it is worth over $10,000,000 per annum, which is more than three times what would be necessary to pay the interest on $100,000,000, the estimated cost of the proposed canal.

Industrial progress governed by cheap power.

The progress of all the great industrial nations has been in the ratio of their production of coal. That is to say, cheap power underlies their progress, and without

cheap power, it would not have been possible for them to have attained the high position they hold in the industrial world.

Therefore in rendering the production of cheap power possible, we shall secure many industries which we could not have under present conditions, and thus we shall add a great deal to the national wealth of this country.

Industries operated by electric power. Take the manufacture of wood pulp for instance. The hon. member for Russell will bear me out when I say that wood pulp cannot be profitably produced in this country by steam power. It requires cheap power. With coal at $3 a ton we could not have the pulp industry, and wood pulp is only one of many such industries.

I may give a few other examples of the use which can be made of cheap electric power.

Smelting by electricity. One is electric smelting which is now in its infancy. Smelting by electricity all manner of minerals, including such base ores as the ores of iron, is now possible, thus absolutely dispensing with coal and making the production of iron possible, where the transportation charges of the ore or of the coal rendered the production costly or impossible.

The process of electric smelting is based simply on the enormous temperature produced by the electric furnace. The ores fuse and the oxygen which they contain is driven off as gas, leaving the pure molten metal behind.

It is different in principle from smelting with coke, where the carbon of the burning coke first combines with one atom of oxygen of the air, making carbon monoxide, and then with another atom of oxygen from the ore which does not fuse, forming carbonic acid gas and escaping as such from the furnace. The oxygen of the ore is thus slowly taken up

by the carbon of the coke until nothing but the metal is left in a molten state.

Production of nitrates by electric power.

Another use of electric power is fixing, as it is called, atmospheric nitrogen so as to make it available for fertilizing agricultural lands in precisely the same way that the famous nitrates from Chili and the guano from Peru are used.

The atmosphere contains an inexhaustible supply of nitrogen, but in an inert form as the scientists say, that is, it is not taken up readily by plants, or rather by the bacteriae through which they feed on nitrogen. The best means have always been to supply the nitrogen to the ground in the form of a soluble salt, and hitherto only nitrate and guano, and animal or vegetable manure have been used, because chemists had not found the way to produce nitrogen salts out of atmospheric nitrogen.

But, by means of the terrific temperature of the electric furnace, that long sought result

has been achieved, and the production of nitrate from atmospheric nitrogen is to-day an industrial fact in Norway. At such temperature, the recalcitrant nitrogen combines with lime and makes a soluble salt, that is, all that is necessary for the purposes of fertilizing.

And those eminently useful applications of the electric furnace are only recent developments.

The world's scientists and inventors are looking for more, and it is pretty safe to predict that more will be found.

Summary of Arguments: canal a great highway.

Let me now briefly summarise my arguments so as to concentrate attention on the salient points.

The canal of 22 ft. will be a huge highway and will develop 1,000,000 horse-power. As a highway, it will bring the Atlantic Ocean into the heart of North America.

The lakes will be a great inland sea, more important than the Baltic and scarcely less so

than the historic Mediterranean. It will liberate the immense lake fleet from its winter fastness and will increase by two thirds its present usefulness. As a consequence, the great standing charges which are now borne by only 7 months of navigation, will be spread over 12 months, thus reducing the daily share and enabling the fleet to carry lake cargoes more cheaply. It will save a large amount of handling of cargo as well as diminish the distance, and thus ensure greater economy of transportation for the products from the West.

And it will divert to the Canadian route and territory all, or nearly all the exports and imports between Europe and the country west of the lakes.

A great source of power. As a source of power, it provides the equivalent of an inexhaustible coal mine yielding some seven millions of tons every year, sufficient for all the industrial needs of two or more millions of people, as busy and as productive as those of

Great Britain, the United States, Germany and Belgium. It will provide power so cheap that many novel industries will be possible which are now impossible with coal. It will be right on the great highway to the West, along lands full of great resources thus offering the greatest inducement for the settlement of immigrants, and for the establishment of industries of every kind.

A good investment.

And lastly the sacrifice of money is not for ever. In years to come, when the power is fully utilized, the capitalization of the profit reasonably expected to be derived from its use will amount to twice or even three times the cost of the whole canal.

This great imdertaking can be carried out for $100,000,000 and we are in the happy position of being able to afford it.

Conclusion.

Let me now enunciate a mere truism. I make no apology for doing so, because truisms do bear

enunciating sometimes in order that we may be reminded of their solid, if self-evident truths.

Material wealth in its ultimate analysis, is the transformation of the raw materials of nature into useful commodities, and the transportation of such materials and commodities from where they are produced to where they are wanted. That transformation requires power — plentiful and cheap — and also highways — commodious and economical.

When we consider that the Ottawa river canal so exactly and in such eminent degree meets both those indispensable requirements of material wealth, need we look for further proofs of its incalculable benefits?

Works such as this are the very foundation of all prosperity. With the Intercolonial Railway, the work of the statesmen who founded the confederation, with the Canadian Pacific, the work of that other eminent statesman, Sir John MacDonald, and with the

Grand Trunk Pacific, the work of our great Prime Minister, the Ottawa river canal would rank as one of the very corner stones of the future greatness of a young, vigorous and ambitions country.

THE END

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